ROCKS *and* MINERALS

Official Journal of the Rocks and Minerals Association

Twentieth Anniversary Number

Vol. 21, No. 9 Whole No. 182

A Magazine for Mineralogists, Geologists and Collectors

SEPTEMBER, 1946

35c

FIFTH LIST OF FINE MINERALS

From An Old Collection

Arsenopyrite, Freiberg. Bright ½" xls. w. Calcite. 2½ x 1¾	$ 5.00
Malachite ps. Azurite, S. Australia. Xld. very good. 3 x 2½	6.00
Malachite, Portugal. Distinct xls. on rock. 3 x 1½	5.00
Bermanite, Arizona. Minutely xld. on Triplite. 2½ x 2½	10.00
Clinohumite, Monte Somma. Small transparent xls. on rock. 1½ x 1	2.00
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Hematite, Elba. Well xld. with tarnish. 2½ x 2	4.00
Phosgenite, Sardinia. Xld. mass. 3 x 2¼. (16 oz.)	10.00
Microlite, Virginia. Very large incomplete xls. 2¼ x 1½	7.50
Rutile, Graves' Mt. Group of brilliant xls. 2 x 1¼ x 1¼	5.00
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Epidote, Tyrol. With Byssolite; small but choice group. 1½ x 1¼	5.00
Gahnite, Franklin. Large blue xls. in Calcite. 2½ x 2.	6.00
Apatite, Franklin. Complete 1½" blue xl. in Calcite. 2½ x 2	3.00
Franklinite, Franklin. Good 1" xls. in Calcite. 3 x 2	5.00
Barite with and enclosing xld. Cinnabar, Germany. 2½ x 2½	3.50
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Cassiterite, Newry, Me. Very large crude xl. w. Loellingite. 3 x 2½ x 1½. (2 lbs.)	5.00
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Sphalerite, Phoenixville, Pa. Well xld. w. Quartz xls. 3 x 2½	2.50
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Stannite, Cornwall. With some Quartz and Chalcopyrite. 2½ x 2	1.25
Caledonite, Leadhills. Minutely xld. w. Linarite in rock. 2½ x 2	7.50
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LOOSE CRYSTALS:

Azurite, Tsumeb. Very fine solid brilliant 1¼" xl.	$ 7.50
Hematite, Switzerland. Tabular brilliant xl. 1"	3.00
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Cerussite, Tsumeb. Good complete twin xl. 1"	5.00
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Tourmaline, Maine. Black well terminated xl. 2 x 1½	1.50
Phenacite, Norway. Very large xl. 1½ x 1⅛"	10.00
Azurite, Tsumeb. Very fine complete 1" xl. on small matrix	3.00
Smoky Quartz, Chatham, N. H. Good 1¾ xl.	1.00
Cassiterite, Nigeria. Good 1¾" twin xl.	7.50
Scheelite, Greenhorn Mts., Cal. Very fine 1" white xl. Fluor.	6.00
Aragonite, France. Repeated twin 1¼" enclosing red Quartz xls.	1.50

Transportation extra. Terms cash with orders. Money refunded on unsatisfactory specimens returned within one week of receipt.

HUGH A. FORD

OFFICE AND SHOWROOM: 110 WALL STREET NEW YORK 5, N. Y.

Telephone: BOwling Green 9-7191

No lists furnished, but enquiries for specific minerals welcomed.

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PETER ZODAC

September
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CONTENTS FOR SEPTEMBER, 1946

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The official Journal of the Rocks and Minerals Association

CHIPS FROM THE QUARRY

OUR 20th ANNIVERSARY NUMBER

Twenty years ago this month, *Rocks and Minerals* made its first appearance. The first number was a thin issue of 20 pages. The magazine came out quarterly and the subscription price was 50c a year. But with the 2nd issue the subscription was raised to $1.00 a year. Beginning with the December, 1934, issue the magazine became a monthly. On Jan. 1, 1935, the subscription price was raised to $1.50 a year; on Sept. 1, 1937, the price was increased to $2.00 a year; on Sept. 1, 1946 (with this issue) the subscription was raised to $3.00 a year.

With each increase in price the magazine was greatly improved and more pages added. The present increase, however, was forced on us due to the greatly increased printers charges which since July, 1941, has risen 40%.

Rocks and Minerals circulates all over the globe--in every continent and in many important islands. It followed our fighting men, too, whether they were in the army, navy, or air force.

Twenty years is a long time to publish a magazine and it has given us a most valuable and wide experience and brought to us a host of very good friends. Our grateful thanks are extended to subscribers, dealers, contributors, and friends who have in any way helped *Rocks and Minerals* to reach its present high and eminent standing .

Topaz at La Jolla Beach, California

Can any reader give first hand information on the deposit of topaz crystals in several colors at La Jolla Beach, near San Diego, California? The deposit is said to be in a sandy area either two or five miles inland, and that the crystals run up to two inches long. Should there be any substantiation to the report, the locality, if known exactly, should form a crystal hunter's paradise.

Field Trips Via R. & M.

Editor R. & M.:

How we do enjoy *Rocks and Minerals!* We take our trips thru it these days.

Orlin C. Baker
Great Bend, Kans.

Aug. 13, 194

From A New Subscriber

Editor R. & M.:

Rocks and Minerals is a mine of information to Rockhounds and I will be very glad to receive it regularly.

B. A. Dopson
Santa Paula, Calif.

June 15, 1946

McCrory in Arizona

Hugh McCrory, a member formerly residing in Dillon, Mont., is now in Prescott, Ariz., where he is sampling gold-bearing gravels on Lynx Creek, a few miles south of Prescott.

Revised Lapidary Handbook: By J. Harry Howard.

That lapidary work is making great strides in America can be attested to by the appearance of Howard's newest book "Revised Lapidary Handbook". Mr. Howard is dean of America's writers on the lapidary art and his new book was designed to provide practical instructions in all kinds of gem cutting for the beginner and the advanced amateur; it came out June 5, 1946.

The new book is a big improvement over his "Handbook for the Amateur Lapidary" which came out in 1935 (1st printing) and in 1940 (2nd printing). Not only have the pages been increased but the text matter has been thoroughly revised and brought up-to-date and many new illustrations added. The contents are divided into 20 chapters titled as follows: Sawing, Cabochon cutting, Large flats, Gem drilling, Bead making, Cutting faceted gems, Advanced facet cutting, Optics of Brilliants, Mosaics, Impregnation of gem materials, Artificial coloring of agate, Soft carving with steel tools, Carving and engraving hard materials, Sphere making, Bracelets and rings, Cutting gems by hand, Diamond as abrasive, Cutting of diamonds, Miscellaneous useful information, Sources of supply.

The book is 5¼ x 8 in size, contains 220 pp with many illustrations, has an attractive blue cover, and sells for $3.00.

This very interesting and very informative book—the last word on gem cutting—should be in the hands of every cutter. Order your copy direct from the author, J. Harry Howard, 504 Crescent Ave., Greenville, S. C., or from your dealer.

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THE FISH SPRINGS AREA, UTAH

BY RONALD L. IVES

Vice-President, R. & M. A.

ABSTRACT

Hot springs, located along an extensive fissure north of the Fish Springs Mountains, in Toole and Juab Counties, Utah, are described, and their relations to other features of the area outlined.

INTRODUCTION

Covering several square miles of desert north of the old Pony Express trail, north and east of the Fish Springs Mountains, in the western parts of Tooele and Juab Counties, Utah, is an extensive series of hot and cold mineral springs, apparently related to a long fissure that crosses half of the State of Utah, trending approximately N 60° E.

Although locally classed as a "Little Yellowstone," these springs are actually rather standard medium-sized mineral springs, of which several hundred can be found in the Great Basin area.

Data here presented were collected on one visit to the area in 1925, and during more than three years service at an Army post not far away.

LOCATION AND ACCESSIBILITY

The Fish Springs area is located largely in Tooele County, Utah, at approximately Lat. 39°55' N, Long. 113°26' W, Altitude 4250' MSL. Due to cartographic discrepancies, an error of one mile may exist in this location.

Approximate location of Fish Springs, and its relation to other features of the area is shown in Fig. 1. This map is compiled from the best available data, including aerial photographs, but is not as accurate as a map of a better surveyed area.

Fish Springs can be reached from Salt Lake City via Lehi, Fairfield, Faust, and Simpson Springs; via Tooele, St. John, and Simpson Springs: and from Nevada via Gold Hill or Trout Creek and Callao. Roads into the area are good desert roads. Spare tires, tools, water and gasoline should be carried. Do not use roads not shown on this map, as they are likely to be military access roads, not legally usable for civilian travel. Do not enter military reservations without *written permission, obtained in advance,* from the commanding officer of the reservation. If you find something that looks like a bomb in some isolated desert area, do not tamper with it to see what will happen—it probably is, and it probably will!

GENERALIZED GEOLOGIC ENVIRONMENT

Fish Springs is located on the Salt Flats, of later Pleistocene age, just north of the Fish Springs Mountains, composed of multiply mineralized early Paleozoic limestones and sandstones. Some Tertiary volcanic materials are found nearby, as are a few Pliocene sediments, usually not easily distinguishable from the more plentiful Pleistocene deposits, largely associated with ancient Lake Bonneville. Most of the early limestones and sandstones are silicified, so that all gradations from sandstone to quartzite; and from limestone to dolomite and lime silicate, can be found in a short time. Numerous igneous rocks, of all ages and crystalline structures, can be found in the area, largely in the form of intrusions.

A general view of the north end of the Fish Springs Mountains is shown in Fig. 2.

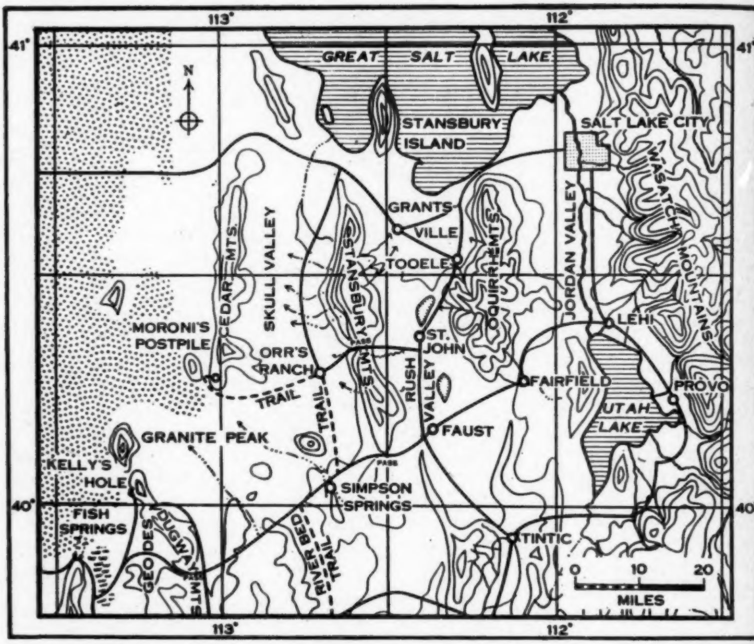


Fig. 1 Generalized map of the Utah Desert area, showing major topographic features, points of geologic interest, and access roads. Contour interval about 1,000 feet, lowest contour 5,000 feet.

COLD SPRINGS

A large number of cold spings can be found south and east of Fish Springs, scattered through the marshes (swamp symbol, Fig. 1). These are mostly of reasonably good water, only slightly brackish, and have temperatures from 55° to 80° F. Care should be used when walking around these springs, as turf sometimes shelves out several feet over the water, and collapses when walked on. These springs have at times furnished water for various mining enterprises, and are now used as water supply for a fur farm. Numerous stunted trout can be caught in the larger springs, but must be thoroughly cooked, as many of them are diseased. Migratory water birds stop regularly at Fish Springs, and some usually winter there, as the water seldom freezes near the larger springs.

HOT SPRINGS

The hot springs at Fish Springs are located on the flats north of the Pony Express trail, and can be reached over a wheel track from the old smelter ruins (crumbled stonework and parts of stack) north of the road. Do not drive past the end of the wheel track. The nearest tow car is 30 miles away, and there is no telephone.

At the end of the access road is a field of Salt Flowers (Fig. 3). These are globular incrustations of salt, caused by evaporation of upwelling saline ground water. Although usually yellowish-white, occasional red or green salt flowers can be found. These flowers are regenerated seasonally, and are at their best in June and July, just after the end of the spring rains.

General arrangement of the major springs (1945) is shown in Fig. 4. Each spring is surrounded by a sinter deposit, colored reddish brown, with green markings where spring water supports algal growth. In walking around these springs,

Fig. 2 North end of the Fish Springs Mountains from Hot Spring # 1. Note salt flowers in the immediate foreground; salt marsh in the middle d istance; and shoreline structures on side of mountain. Long range photographs in this area are usually "Fuzzed" because of "boiling air".

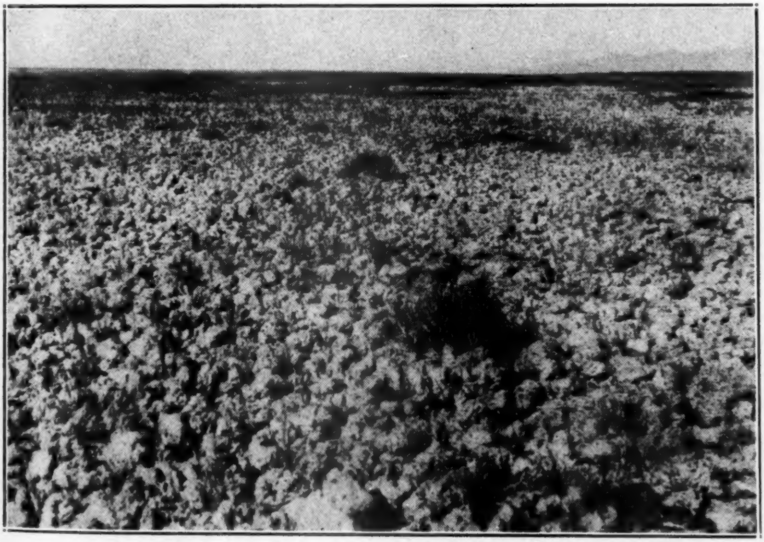


Fig. 3 Salt Flowers northwest of Spring # 1. These are caused by capillary upwelling of saline ground water, which evaporates at the surface, depositing its salt. These salt flowers regenerate each year, after the end of the spring rains. Due to impurities in the water, they are sometimes weirdly colored.

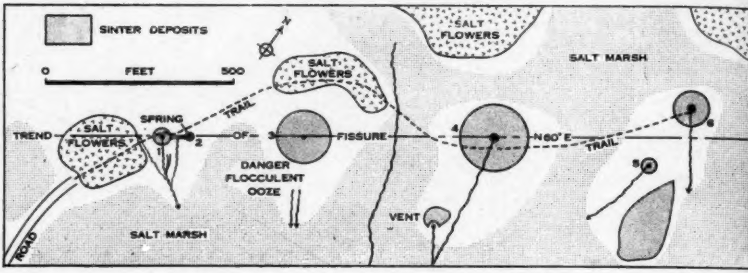


Fig. 4 General arrangement of Hot Springs.

stick to the trail, and avoid spring #3, which is surrounded with hot ooze, into which a man may sink for several feet.

Appearance of Spring #4, as seen from the edge of the sinter cone, is shown in Fig. 5. The other springs do not differ *markedly* from this, although each is an individual, having its own characteristic details.

Of special interest in this area are the intensely green algae which grow in the springs, even when the temperatures are as high as 140° F. These algae are of some importance in the precipitation of sinter, and act as host to various diatoms, whose silica skeletons form precipitation nuclei for sinter.

One algal collection from Spring #4 was studied by Dr. Ruth Patrick, Diatomist of the Philadelphia Academy of Natural Sciences. In it were found numerous *Synedra radians,* and what may be a new variety of *Navicula aponina* which heretofore has not been reported from North America. The outflow from spring #4, in which algae are plentiful, is shown in Fig. 6.

Temperatures of the springs, measured in the spring of 1945, are as follows:—

Spring # 1	107° F.
Spring # 2	138° F.
Spring # 3	88° F.

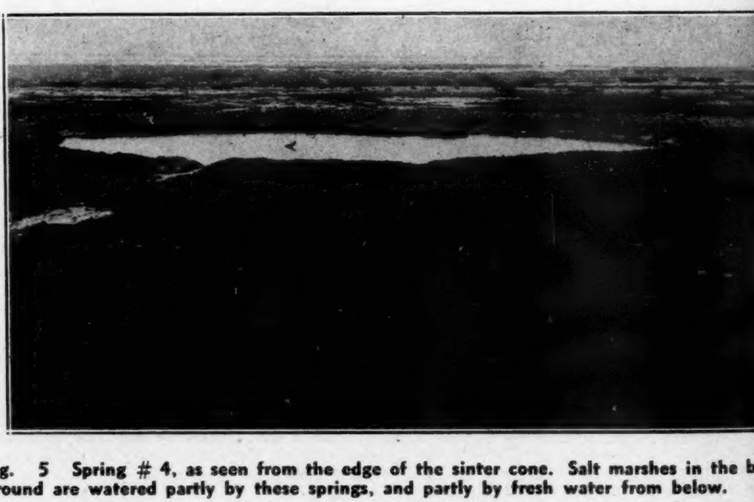


Fig. 5 Spring # 4, as seen from the edge of the sinter cone. Salt marshes in the background are watered partly by these springs, and partly by fresh water from below.

Spring # 4	140°	F.
Spring # 5	97°	F.
Spring # 6	136°	F.
Vent	140°	F.

Other measurements, made by Maj. W. S. Wallace, CWS, and Capt. A. M. Salisbury, CE, later in the year, were in close agreement, and indicated that there is no seasonal variation in water temperatures. Reports by local residents, however, indicate that there may be long term variations, and that both temperatures and outflow may vary after minor earthquakes, which are not uncommon in the area,

Soundings in spring # 4, made with a thermocouple attached to a sinker, are summarized in Fig. 7. Below the 50 foot depth, electrochemical action made the thermocouple indications invalid; and the thermocouple wires disintegrated at about the 85 foot mark. Field tests suggest that springs having temperatures at or near 140° F. are from the fissure zone, while those having markedly lower temperatures get part of their inflow from near the surface.

No thorough chemical analysis of the hot spring waters is available. Various tests indicate a high sulphur and iron content, and traces of selenium and thallium are present in some samples. Careful tests show no traces of mercury, although at other locations along the same fissure trend, mercury has been found, in somewhat similar springs. Water from these springs has a strong cathartic action, and is a skin irritant. Presence of traces of selenium and thallium indicate that it should not be used internally, unless prescribed by a physician.

Outflow from most of the springs is fairly constant from season to season and from year to year. The small spring marked VENT in Fig. 4, however, is intermittent. Study of the sinter deposits around it suggests that it may at one time have been a small geyser, which "blew its top" a considerable time ago.

Vapors given off by the numbered springs and the vent are largely a mixture of steam and hydrogen sulfide. The amount of visible vapor depends upon the temperature and relative humidity of the outside air; the actual amount, as indicated by size and frequency of rising bubbles, seems to be influenced by barometric pressure.

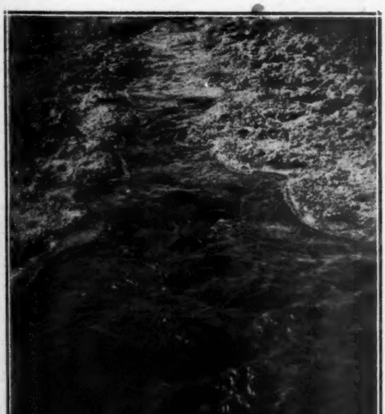


Fig. 6 Outflow from Spring # 4. Sinter deposits along the watercourse are intermixed and brilliantly colored with algal growths. Water temperature here is 140° F.

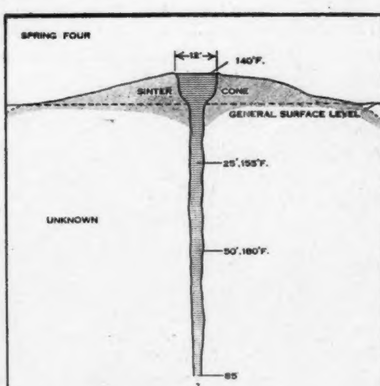


Fig. 7 Cross section of Spring # 4, showing approximate shape of tube, and temperatures at various depths, as indicated by thermocouple measurements.

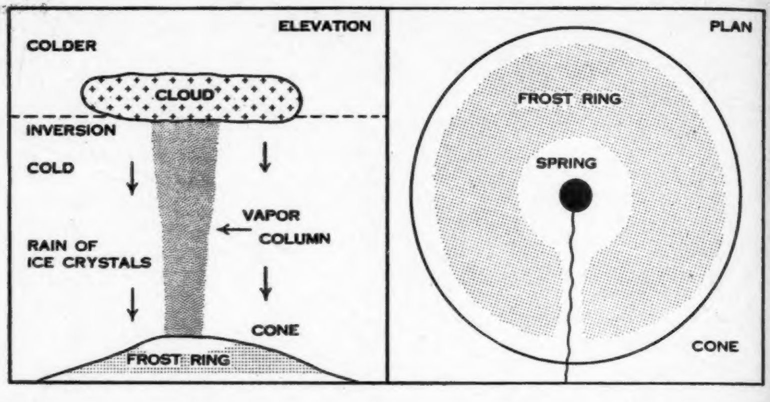


Fig. 8 Local "Weather Factory" occurring at Fish Springs when air temperatures are very low.

In very cold weather, when the thermometer is far below zero, the springs give off a visible column of vapor, giving them the appearance of geysers from a distance. When it is very cold, and there is no wind, and the air is stratified so that it is considerably colder 100 or so feet above the surface, the springs become a local weather factory, and duplicate, on a small scale, the convection phenomena occurring at all times in the atmosphere. Evaporation from the spring rises through the cold layer, condenses in the colder stratum higher up, and the moisture is precipitated, as ice crystals, around the spring cone. This action, idealized, is shown in Fig. 8, where the vertical extent is greatly condensed. Vapor behavior of this type is to be expected when air temperatures are about 20° F. below zero. Similar frost rings about thermal springs have been noted in cold weather in Yellowstone Park, and elsewhere.

AGE OF SPRINGS

An attempted dating of these springs, by study of the sinter cones and their relation to other features of the area, suggests that the present spring cones are thousands, but not millions, of years old. Assuming constant flow, and deposition throughout at about the same rate as in the past 50 years, the cones are somewhere between 4,000 and 6,000 years old. As the shoreline of a lake stage tentatively correlated with the "Little Ice Age" of 4,000 years ago is at a slightly higher level than the tops of the spring cones, this would indicate that the present cones began forming as the waters of this lake stage receded.

Evidence of cone formation prior to this lake stage is lacking, either because no cones formed before this time, or because the older cones were eroded away. The latter seems most probable, as there was extensive volcanic activity in this area during the higher stages of Lake Bonneville, tentatively placed at 20,000 years ago.

CONCLUSIONS

The Fish Springs area is of considerable interest to the geologist and mineralogist because of the relationship of the springs to other features of the area. These springs are rather typical Great Basin hot springs in their environmental relations. Further study of the springs over a period of years, to determine the relationship, if any, between earthquakes and the rate of outflow, seems desirable.

THE GOLD MINES OF MONTE AGUACATE, COSTA RICA

Robert Rex, c/o U. S. Embassy, San Jose, Costa Rica

Monte Aguacate in the San Ramon mountains is penetrated by about fifteen mine tunnels. At the present, work is going on in the *San Juan*, the *Don Fabio*, and the *San Rafael* tunnels. The Compania Aurifera Nacional of Costa Rica owns the mines and is operating the *San Juan* tunnel. The Rosario Mining Company has an option on the mines however, and is operating two tunnels, the *Don Fabio* and the *San Rafael*.

The mines are in the western part of Costa Rica and may be reached from the Pan-American Highway by leaving the surfaced road in San Ramon and taking a dirt road south to Desmonte de San Mateo. At the present this road is only passable in a jeep or oxcart. Horses for this trip may be rented in San Ramon.

The easiest approach to the mines is by way of the railroad stop of Concepcion. It is 40 miles east from the Pacific port of Puntarenas and 37 miles west from San Jose, the capital. The trail from the railroad station zigzags up a very steep mountain and then levels off, following a ridge almost to Desmonte. The trip on foot, with packs, takes two hours and by horseback, one hour. There is a beautiful view of the Pacific Ocean from the last part of the trail.

Monte Aguacate is composed mainly of an extrusion of andesite.* Whether this extrusion is from Volcano Poas or Volcano Barba is not known. The covering of volcanic debris, ranging from ash to bombs, has erroded away, leaving a very thin skin of soil and sod on the andesite.

Faults are frequent and very often form pockets. These are filled in with silica leached out of rocks from a higher level. Grains of gold are transported along with the silica which is in a collodial state. The gold is deposited along with the silica and occurs disseminated throughout the quartz.

The veins of auriferous quartz of *San Juan* are parallel to the chalcopyrite-rhodonite veins in *Los Castros*. The mountain runs roughly east-west while the veins run at right angles or north-south. All the mines in operation now strike the veins from their southern ends. There are a number of tunnels on the northern side of the mountain but they are deserted.

* Identified by Don Ramiro Montero, Professor of Geology, National Uuiversity of Costa Rica.

Looking south from *Don Fabio* mine entrance. The mountains in foreground are of volcanic origin, those in the background are sedimentary. The Pacific Ocean is just a few miles beyond the distant mountains. (The sapplng on right is a lemon tree).

The *Los Castros* tunnel cuts into a type of deposit entirely different from that of San Juan. The tunnel was pushed in fifty feet when the owners decided that there was not enough chalcopyrite to make the mine pay. At the present it is very dangerous to enter the mine, because it is flooded and poisonous gases have been formed by the decomposition of the sulfurous ores. These gases are principally CO_2, SO_2, and H_2S.

Very often when a large pocket of auriferous quartz is struck it ends in a blank wall. This is usually due to faults. The engineers told us that faults and an enormous amont of seepage water are the bane of Costa Rican mining.

Entrance to the *Don Fabio* tunnel.

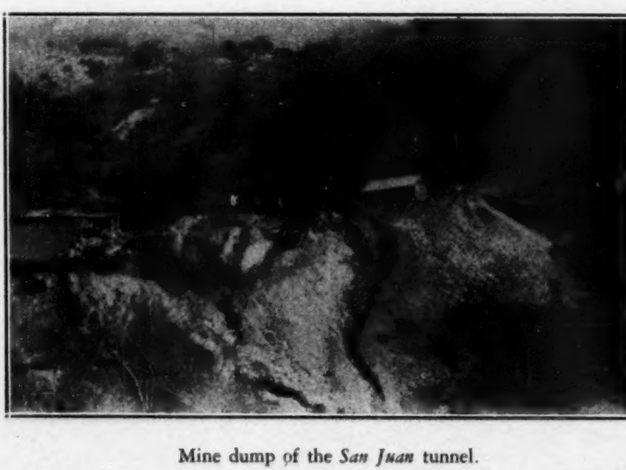
Minerals Found in the Mines

CHALCOPYRITE: massive, from brass yellow to iridescent, with sphalerite,, and rhodonite in the *Los Castros* tunnel. It occurs in fairly large quantities; the main mineral extracted from *Los Castros* was chalcopyrite.

GALENA: crystals and pockets in quartz. Frequently argentiferous and containing antimony and arsenic.

GOLD: usually occurs as finely disseminated grains but sometimes as small plates in and on the quartz. Usually contains some arsenic, also silver.

PYRITE: very small cubic crystals on auriferous quartz.



Mine dump of the *San Juan* tunnel.

PYROLUSITE: pseudomorph after rhodonite. This occurs in the *Los Castros* mine.

QUARTZ (auriferous): crystals are almost always singly terminated, milky white to water-clear, and may be found in sizes up to six inches long. They occur as linings of vugs. *Drusy quartz* is common and often very beautiful. *Agate* is common and usually consists of bands of clear, cloudy, white, and grey quartz. Occasionally it contains bands of pale Amethysts and Citrine. Amethyst occurs as crystals and as bands in agate. *Chalcedony stalactites* are found occasionally and are very beautiful. *Citrine* occurs as bands in agate.

RHODONITE: This manganese metasilicate is the most interesting mineral found at Monte Aguacate. It occurs foliated with semi-pearly to silky luster, and pale to deep rose pink. The rhodonite from the *Los Castros* tunnel is extremely tough and might make good cutting material. It occurs in veins one to t hree inches thick with sphalerite, chalcopyrite, and pyrolusite. It alters slowly to pyrolusite on exposure to air. It occurs in acicular crystals in quartz in the San Juan tunnel.

SPHALERITE: lameller, vitrous luster, yellow to deep brown, in veins one-half to one inch thick. Occurs associated with rhodonite, chalcopyrite, and pyrolusite in the *Los Castros* tunnel.

STIBNITE: slender prismatic crystals up to one and one-half inches long. Usually in radiating crystal groups associated with quartz. Most frequently found in the *Los Castros* tunnel.

HEMATITE OCCURRENCE IN A WRONG PLACE

BY WALLER V. MORGAN

Scarsdale, N. Y.

A few weeks ago a friend and I drove to the southern end of the Bronx River Parkway in upper New York City. The Parkway is being extended and there are a few rock cuts near Allerton Avenue. As New York City is noted for minerals, we naturally expected great things!

We found Manhattan schist, limestone, and a small pegmatite dike, also a small vein of magnetite. Nothing to get excited about. In the grading back of the rock cut we found some broken red brick, some porcelain bathroom fixtures, and what looked like malachite but when dugged up it turned out to be a corroded electric light fixture. Then all of a sudden I stumbled upon a large mass of red hematite! I hit it with a hammer, it broke open to reveal some fair calcite crystals. And near the hematite I ran across flint—a good nodule—and next some pieces of coal. The coal, I inferred, was from the steam shovels on the job but—the shovels burn oil!

There was so much hematite in the fill —and it did not look native—that I hunted up the job superintendent to inquire about it and he told me that it came from ———!

We became greatly excited after receiving his answer and we spent the following day (Saturday afternoon) hunting the dump for more hematite and found lots of it, some of it was crystalline to a degree. More calcite crystals were also found, also siderite crystals, many fine flint nodules, a piece of manganite partly surrounded by calcite crystals, coal containing fossils, and a small mass of chalk.

Now what do you suppose the superintendent told us? He said that the hematite and all other minerals in the fill had come over as ballast from ENGLAND!

The spot is along the east side of the Bronx River, just north of Allerton Ave. (possibly several hundred feet or more from Allerton Ave.). If the area is not completely filled, some old steps, partly covered by fill, marks the spot where hematite has been dumped.

URANIUM EXHIBIT FURNISHES BACKGROUND FOR POPULAR TOPIC OF THE DAY

BY PETER ZODAC, Editor Rocks and Minerals

In connection with the opening of the new Mineral Resources Room at the Brooklyn Children's Museum reviewed in our last issue, Jack Boyle set up a most interesting and informative exhibit on the most popular topic of the day—atomic energy. The exhibit consisted of specimens and explanatory texts laying particular stress on the mineralogical aspects of the subject.

The Editor found the exhibit so interesting that he asked Jack for copies of the texts. In the belief that our readers will be interested in the clear, concise presentation of the subject which Jack has made, they are reproduced below.

The exhibit contained about 40 specimens, representing 29 species of radioactive minerals. Especially notable among the specimens was a portion of a crystal of Cleveite froom Auselmyren, Norway, presented to Jack by Prof. Ellen Gleditsch, famous specialist on Age of The Earth determinations and head of the Department of Inorganic Chemistry, University of Oslo. This portion of a crystal represented the remainder of one on which Prof. Gleditsch published a comprehensive study 'in layers' and an autographed copy of the paper accompanied the specimen, both of which were presented personally to Jack on his visit to Mlle. Gleditsch's laboratories in 1938. He was very happy to be able to tell your Editor that through a friend he had recently learned that Prof. Gleditsch was unharmed during the occupation of her country and was again back at her laboratories.

Another notable specimen was one of Samarskite from Petaca, N. M., presented to Jack by Dr. Frank L. Hess, of the U. S. Bureau of Mines, on which he wrote a paper showing that the core of the crystal was 150 million years older than the outside portion.

In addition, a fine crystal of Thucholite deserves notice and likewise a small, complete botryoidal mass of pitchblende from an intersection of the two principal veins of the famous Jachymov Mine in Czechoslovakia. These unattached nodules are very rare in ooccurrence.

Illustrative of the effects of radium in concentrated form was a medicine glass colored deep violet by having been used as a receptacle for spent radon implants and three nesting glass tubes separated by glass wool and used for one of the first radium shipments to this country from Europe, and colored in the same manner. Various articles made of uranium glass illustrated the use of this material for fluorescent effects and for decorative purposes.

A small vial held 2.35 grams of uranium metal, while local interest was served by crystals of monazite and xenotime from the Harlem Speedway, New York City and Allanite from Yonkers. The latter was a find made by members of the Brooklyn Pick and Hammer Club, which is made up of 'graduates' of the Museum Mineralogy course. This study program, once detailed in this magazine, was instituted by Jack Boyle and under his guidance has come to number among its 'grads' a number of mining engineers and geologists—former boys who found an interesting hobby and turned their hobby to practical account.

The exhibit was arranged in two table cases, the first containing the first four texts which follow, and the second case was devoted to the use of the uranium minerals in the determination of the age of rocks.

TEXT ONE—URANIUM THE EXPLOSIVE USED IN THE ATOMIC BOMB

The metal uranium is one of the chemical elements and chemists use the letter 'U' to represent it. Early in this century, as a result of the discovery of radium by the Curies, it was found that chemical elements were made up of dif-

ferent kinds of atoms which were very much alike. These slightly different kinds of atoms of the same elemnt are called isotopes.

There are five kinds of uranium atoms, or isotopes, known as U-234, 235, 236, 237, and 238. About ten years ago it was also discovered that U-235 could be split into two parts and that when this was done an explosion took place which set free an enormous amount of energy.

When the United States called upon its scientists to find a way to use this energy for making bombs it was decided to use U-235 for the purpose. The amount of U-235 in ordinary uranium is 1/140 of the whole, and before it could be used it was necessary to separate it from the other four isotopes. This was very difficult and costly and it took about four years to accomplish. The way in which the bombs were made and exploded is a secret that is known to only a very few of our leading scientists.

Some idea of the power of the bombs may be gotten by considering the small piece of uranium shown here. It weighs about one-tenth of an ounce. In it there is about 3/500 of an ounce of U-235,—a mere speck. This tiny bit of U-235 has enough energy locked up in it to equal that in over a ton of coal. We can not get all this energy but the part we can get is enormous. If we could get all the energy locked up in the whole piece of uranium, it would be equal to what we could obtain from 7600 tons of coal. This amount of coal would fill a train of 152 cars, each holding 50 tons.

This text was accompanied by specimens of ores representing the principal world sources, such as Jachymov, Great Bear Lake, Belgian Congo, Brazil, India, Madagascar, etc. and was followed by the brief statements:—

The principal uranium deposits of the world are located in Belgian Congo, Canada, Czechoslovakia, and Colorado. Others of less importance are located in Germany, Portugal, South Australia, and Madagascar.

Thorium could also be used for making Bombs. It can be obtained from large deposits of monazite sand located in Travancore, India, and Brazil. Lesser deposts exist in North Carolina, Australia, and Malaya.

TEXT TWO—HOW TO DETECT URANIUM MINERALS IN ROCKS

When uranium minerals are present in rocks they can be quite easily detected by certain changes which they cause in the rocks which are close to them. These change are the following:—

1. Radial fracturing. The rock surrounding the mineral will show small cracks or fractures which radiate in all directions from the mineral.

2. Discoloration. Close to the mineral the rock will be of a different color from what it is farther away. Feldspars will be reddened and those which are red in the mass of the rock will be of a deeper shade near the mineral. Quartz will be black or dark gray instead of the usual white or clear variety. Calcite, if colored in the rock, will be bleached where it is close to the mineral.

3. Decomposition Products. Uranium minerals are subject to considerable changes due to their radioactivity. As a result the rock is often smeared with the minerals which come from this process. Of these autunite and uranophane appear as canary-yellow powders; gummite is an orange-yellow waxy material, and torbernite appears as small, green flakes with a pearly lustre.

The uranium minerals are the only ones which produce these effects in rocks. In case of doubt, uranium minerals can always be detected by placing them on a piece of photographic paper in a dark room for a day or two. If uranium is present a photograph of the mineral will appear when the paper is developed. If water is suspected of being radioactive the same effect will appear if the paper is used to cover a freshly drawn glass of it. Such water should never be used for drinking. The photo-paper test can also be used to detect thorium.

This text was illustrated by specimens showing the phenomena described, especially interesting being a mass of quartz, of dark color, and split open by the effects of a crystal which left a cav-

ity suggesting cyrtolite as the cause of the radial fracturing.

The following text we found very interesting and it recalled to our mind the checkered career of many mines of much more recent discovery.

TEXT THREE—A URANIUM MINE THAT IS FAMOUS IN HISTORY

As early as the tenth century silver was being mined in southern Germany in large amounts. During the following centuries the industry prospered as new deposits were found from time to time.

One of the most famous districts was that at Joachimsthal in what is now Czechoslovakia, where mines were operating in the early 1500's. One of the most famous of these was the God's Help mine, opened in 1530. Until 1545 the mines in this district belonged to the Counts of Slick, who minted the silver into coins about the size of our dollar. These coins bore the name of the locality, 'Joachimsthaler' (German for St. Joachim's Valley), and were circulated throughout Europe. They soon became known as 'Thalers' and the Dutch called them 'Dolars', and it is from this nickname that we get our name—dollars.

After being shut down and reopened a number of times, the silver ores were exhausted and it seemed they must close permanently. To prevent this, the chemist, Patera, worked on the uranium ores which were present in the mines and in 1852 he succeeded in producing colors from them for use in the glass and porcelain industries.

This was not sufficient to keep the mines operating and they would have closed finally had the Curies not discovered radium in 1898. In their search for the new element they used several tons of the waste from the color works at these mines. Later, it was decided by the Austrian Government to refine the radium from the pitchblende and the production began in 1908. Since then, this production has been maintained quite steadily.

The statements in the following text as to the differences between two well known minerals are based on the work of Dr. H. V. Ellsworth, of the Canadian Bureau of Mines, but are not so generally understood as might be supposed.

Owing to the difference in chemical composition and the way in which the ores occur in nature, pitchblende is preferred for the production of radium. It is cheaper to remove and to treat chemically. For medical radium, uraninite is not used as it is virtually impossible to free the radium from the thorium. Thorium in medical radium would make it practically impossible to properly control the dosage. Pitchblende and uraninite are the richest of all minerals in uranium. However, as carnotite is abundant in Colorado and Utah and is not very

TEXT FOUR—DIFFERENCE BETWEEN PITCHBLENDE AND URANINITE

	PITCHBLENDE	URANINITE
LUSTRE	PITCHY, OR RESINOUS	METALLIC
FRACTURE	CONCHOIDAL OR ROUNDED	SPLINTERY
FORM	IN MASSES, NOT IN CRYSTALS.	IN CRYSTALS
MODES OF OCCURRENCE	IN VEINS WITH SILVER, BISMUTH, AND SMALL AMOUNTS OF OTHER METALS. THE VEINS ARE OFFSHOOTS OF GRANITE ROCKS.	IN SCATTERED LUMPS OR CRYSTALS IN GRANITE ROCKS.
COMPOSITION	URANIUM OXIDE, FREE OF THORIUM	URANIUM OXIDE WITH VARYING AMOUNTS OF THORIUM.

difficult to refine, it makes a better source of uranium than uraninite. Radium can also be extracted from it which is as pure as that obtained from pitchblende.

One of the most interesting developments of the last quarter century has been the scientific attack on the age-old problem as to the age of the earth, in which the radioactive minerals have been intensely investigated by every possible means. The following text presents this story with Jack's characteristic directness and simplicity—qualities which have added immeasurably to the value of the mineral studies carried on for beginners at the Museum.

TEXT FIVE—RADIOACTIVITY AND THE AGE OF THE EARTH

Some chemical elements, whose atoms are very heavy, do not seem to be able to hold together, for their atoms are continually falling apart; as they do so, parts of the atoms break off and are lost and the elements themselves change into other elements. The parts of the atoms which break off are called Alpha-and Beta particles. In addition, the breaking up of these elements cause them to give off an invisible form of light very much like X-rays, except that these rays are very much more powerful than the ordinary X-rays. The Alpha particles are really atoms of helium gas, which are charged with positive electricity; the Beta particles are tiny parts of atoms, called electrons, and are charged with negative electricity. The elements which fall apart in this way are uranium, thorium, and Proto-actinium. The first two are the most important. Their atoms change from one thing to another and the final change takes place when they become lead. The lead then remains as it is and no more changes take place. Radium is one of the elements formed during the falling apart of uranium; it also finally changes to lead.

Uranium takes 7,600,000,000 years to change completely, but thorium changes more slowly and it takes 19,300,000,000 years to change completely. This automatic change of one element into another is called "radioactivity." This word has nothing whatever to do with either radio or radar; when we speak of "radioactivity" we are talking about the automatic falling apart of atoms, especially the atoms of uranium and thorium.

Early in this century an American chemist, Boltwood, suggested that we might be able to learn the age of rocks by finding out how much change had taken place in the uranium or thorium they contain. Since then many scientists have worked on this problem and today we have a very good idea of the enormous time which has passed since some of the oldest rocks were formed.

This is done by finding out how much lead and how much of the other elements are in the mineral. Suppose we had a clock that would run 24 hours after winding before it would stop again. Now, if we see that it has run for 12 hours, we know that it is half run down. In the same way, if we find a mineral and 1/5 of its uranium has changed to lead, we know that 1/5 of its life has passed. As uranium has a life of 7,600,000,000 years this mineral would be 1/5 as old as this, —or 1,520,000,000 years. The ages of some of the minerals in this display have been determined by well-known chemists of today. Among these is Prof. Ellen Gleditsch, who worked in Paris with Madame Curie for five years. She has been the head of the department of chemistry at the University of Oslo, Norway, for a number of years and is famous for her work on the age of many uranium and thorium minerals.

The oldest mineral that has been found so far is one from Australia. By the amount of lead and uranium found in it, scientists have concluded that its age is about 1,875,000,000 years. By studying a great number of such minerals from all parts of the world, specialists in this work believe that the earth is between two and three billion years old. In addition, some meteorites have also been studied and their ages are about the same, which makes us feel quite sure that meterorites belong to our solar system and do not come to us from other parts of the universe.

We believe our readers will agree with

(*Continued on page 585*)

BESSHI COPPER MINE, JAPAN

One of the great copper mines of Japan is the ancient Besshi mine which ranks next in importance to those of Ashio and Kosaka. This old mine lies near the summit of a steep mountain where the nights, and even some days of a year, are bitterly cold.

Location

The Besshi mine is 12 miles southeast of the small city of Niihama in the northeastern part of Iyo Province (in the northern part of the island of Shikoku), Japan's 2nd largest island. The Besshi mine is not far from the Ichinokawa antimony mines which are famous for having produced the world's finest stibnite crystals.

The ore from the Besshi mine is conveyed by railroad to the wharf at Niihama and from there taken to the smelting works on Shisaka-Jima, an island 16 miles distant.

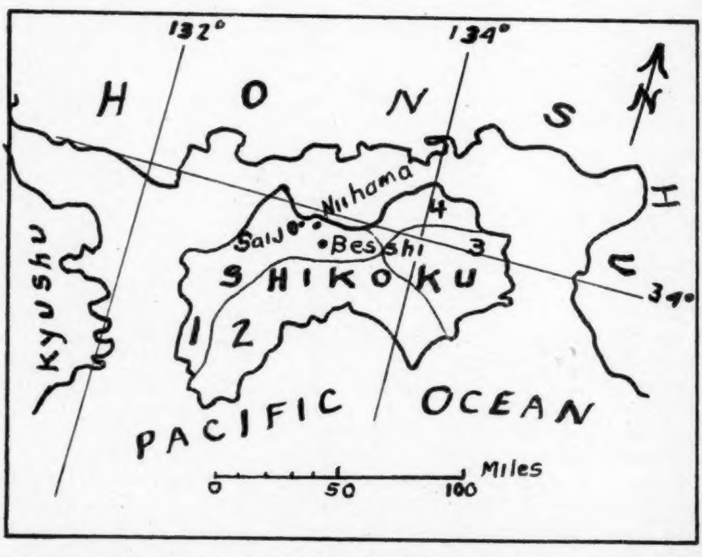
Geology

Accoording to Weed[1] "The Besshi mine is located in the great island of Shikoku near Kyoto, in southern Japan. The deposit is 3600 ft. above tide, in a mountainous region. The district is one of chloritic and graphitic schists, which near the mines contain bands of piedmontite schist, the whole enveloped in quartz-schist.

"The deposit, an immense mass 6000 ft. long, 4 to 30 ft. thick, and over 1750 ft. deep, is intercalated in crystalline schist, and is often called a bedded deposit. The course of the orebody is north 30 deg. east, and it has been worked for 6000 ft. in length. It is usually 10 to 20 ft. thick, and not over 60 ft. The bed dips 45 deg. northeast, and is worked by an inclined shaft.

"The ore consists of chalcopyrite streaks in crystalline pyrite with bands and curved and broken slivers of blackish schist. The ore averages between 3 and 4 per cent copper. The vein is faulted by east to west step-faults at 45 deg.

[1]Weed, Walter Harvey, "The Copper Mines of the World." Hill Publishing Co., New York and London, 1907, p.151



Sketch map of Shikoku, Japan's third largest island, showing location of Besshi, near the northern coast, in northeastern Iyo Province (No. 1).

to the strike, that dislocate the orebody 10 to 20 ft., and never over 60 ft. The production was 10,425,800 lb. in 1902."

Mineralogy

Among the minerals found at the Besshi mine are:

Albite: Found as minute crystals (druses) in chorite schist in the neighborhood of the mine.

Calcite: Large crystals with poorly developed faces are sometimes found in cavities of the gangue, also as minute crystals associated with chalcopyrite.

Chalcopyrite: Nice crystals occur at the mine. Minute crystals of calcite and siderite are often associated. It is chiefly found in a massive form as it is the main ore of the mine.

Gypsum: Colorless and transparent crystals of selenite are sometimes found associated with pyrite.

Magnesite: Occurs as small crystals in talcose rocks.

Magnetite: Forms thin layers in pyrite; crystals are sometimes found in quartzose druses.

Pyrite: In crystalline masses.

Rutile: Small masses.

Siderite: Minute crystals.

Tetrahedrite: In minute crystals; also in veinlets in which tetrahedrite is well crystallized.

FLUORESCENT FLOOSIE

BY TOMMY — The Experimental Mineralogist

Several years ago Franklin, N. J., willemite came to hand. There were a few specks of zincite thruout the piece and a few tiny black octahedrons of franklinite but the bright apple green color was relieved by a slightly traced design of pale pink. Apple green hardly describes the color, it appeared much the same opacity and color as a well known brand of soap that gives a schoolgirl complexion.

A cabochon of this material two inches long on the oval was cut and being polished when my wife happened by.

"How beautiful! What is it? Such a lovely color!" She was enthusiastic.

"Willemite with zincite, franklinite and probably troosite and/or tephroite."

"It looks like an old hand painted china brooch. What are you going to do with it?"

"It fluoresces a brilliant green. I will put a three-quarter inch circular cab of Ontario hackmanite on each side. They will fluoresce the complimentary color." I held one up for her to see as I flipped on the black light.

"And in the daytime that green and the pale pink color go well. How did you get the cherry red on the hackmanite? I thought it was pink."

"It is, until you give it a little of the iron arc or any high intensity ultra violet. Then it is photosensitive but that fades in the sunlight. It can be charged up time and again."

"I see. You are making this for some floosie so you can find her in the dark! I suppose I will find you in one of these joints that go in for fluorescent floor dancers, fluorescent pictures on the wall, and fluorescent dames!"

"Oh, no! Heaven forbid! You are the floosie that will wear this. You know those fluorescent or black light joints did not thrive."

"I wonder why?"

"Well, the whites of her eyes, her nails and her teeth fluoresced-but two peg teeth in the front were brown. False teeth are horrible under such a light, lipstick too."

"Oh, really? And will I have to carry around a black light outfit when I wear the brooch?" We both laughed. "I suppose the grease spots on his vest fluoresced?" she said.

It is one of her favorites and I saw her today with a plum colored dress against which that brooch was terrific. Now I am making her a string of willemite beads of the same material.

Bibliography: A New Property of Matter—by O. Ivan Lee, The Dana Magazine, First Quarter Publication—page 11.

A TRIP TO MICHIGAN'S UPPER PENINSULA

BY H. A. EVERHART
Cuyahoga Falls, Ohio

I sure enjoy reading in *Rocks and Minerals* about stone hunting trips, so this spring my two pals, Philip Schnabel and William Hilston, and myself planned a trip to Northern Michigan. Another rock hound, Harold Berryman, could not make it this time, so the three of us started.

We left Cuyahoga Falls, Ohio, on Saturday morning, June 15th, and drove 450 miles to Elk Lake, Michigan, where Mr. Schnabel, or Phil, as we call him, has a large log cabin built high up on the banks of Elk Lake, where you get a cool breeze at all times, and did we enjoy a good night's sleep!

The next day we got our equipment all together and packed in the car, and left on Monday morning for the start of the second leg of our journey, 90 miles due north, to the City Mackinaw, then on board the ferry; a two hour trip across the Straits and we were in St. Ignace. Taking U. S. Route 2 west, we went to the town of Rapid River. There we looked up our friend, Werner Vietzke, owner of the Hiawatha Mineral Shop. And has Werner got some rocks! Minerals in every room—in every building—and all over the yard. He certainly is a very interesting man, and has a fine collection of minerals. If you ever get to Rapid River, stop and visit with him.

From there we started north on U. S. 41 to Marquette, on Lake Superior, then west to Ontonagon, also on Lake Superior. On the shore of Lake Superior we spent a day hunting agates, and we had fair luck getting some good agates and a lot of other interesting stones and fossils. We then headed for Copper Harbor, which is the most northern point in Michigan and on the famous Keweenaw Peninsula. On Route 26 we passed through the vast timber holdings of The Ford Motor Company. This company has their mills and loading docks, both for shipping by rail and water, located here.

On through the cities of Painsdale, Houghton and Hancock. The city of Hancock is built on a high hill which overlooks Houghton, and with a field-glass one can see miles of forest on one side and out over Lake Superior on the other. The copper mines of Atlantic and the Franklin are in this district.

On north to Copper Harbor, where we spent several days, we found some good agates along the shore east of Old Fort Wilkins. Fort Wilkins was built in 1864, and is now a government park. This is a great game country, plenty of deer and bear. And speaking of bear one big black bear got into the garbage can one night and we went out to see him. There he was, sniffing around the rear door. The caretaker said, "He is looking for his supper, he is hungry." So "yours truly" just stayed in the cabin.

While in Ahmeek, we called on Henry Luoma of the Keweenaw Agate Shop. Mr. Luoma has a shop and display rooms on Vivian Street and it surely is a busy place. Diamond saws and sanders running all the time! I spent some time looking over his display of rings, cabs, hearts, and rough material. He has anything you could ask for. If you ever get to Ahmeek, be sure to pay him a visit, or at least write to him.

On our way back we stopped at Presque Isle Park, which is just north of Marquette. There we found some very good agates, not so large, but we were not hard to please. From there we traveled east to Newberry, then north to Deer Park. Here we found a few more agates along the Superior shore. This Upper Peninsula is a wonderful country both for the hunter or fisherman, and very interesting if you just want a pleasure trip.

Well, we were soon on our way again, heading south for St. Ignace, across the Straits and back to Elk Lake. Here we hunted for Petoskey agates, and this time we hit the jack pot. I came home with about 200 pounds of the best Petoskey agates I have found, all clean and firm.

This was my first trip up North, and I hope will not be the last. Now back to work and plan for another treasure hunt.

A BRIEF HISTORY OF THE GEM INDUSTRY OF MAINE

BY JANE H. WALLACE, Smith College

The state of Maine has undoubtedly been the foremost of the New England states in the production of gems, and the interest in the gems from this state is unusually high. The few gems now recovered find a ready market at very high prices. The three most important localities are Mount Mica, Mount Apatite, and the area around North Lovell.

Mount Mica

The fall of 1820 marks the discovery of the fine gem tourmalines at Mount Mica just outside Paris, Maine, By Elijah Hamlin and Ezekiel Holmes, two young men, who were interested in minerals. While on a field trip to that locality they were attracted by a shining green object which they discovered to be a crystal. It was late in the afternoon and the following day the winter snows set in, and the two boys were forced to discontinue their explorations until the following spring. They did, however, return then and were rewarded with crystals of quartz, feldspar, tourmaline, cassiterite, lepidolite, and mica. These were sent to Professor Silliman at Yale College, who immediately recognized the tourmalines of the group as ones of great splendor and rarity.

Subsequent to the initial work, little was done here, except for that of Cyrus and Hannibal Hamlin, who uncovered a rich pocket containing 20 large beautiful tourmalines, of which one was over 2" in diameter, perfectly formed at each end, richly green and transparent. These two men also discovered a number of indicolites and watermelon tourmalines.

In 1862 the Maine Geologic Bulletin made announcement of the finding of zircon at Mount Mica. It was said to occur in small, bright, red or brown crystals, transparent and of brilliant luster.

The work at the Maine gem mines throughout their history has been more or less intermittent. Lack of funds or incentive; poor results upon blasting and removal of tons of rock, the discovery of only small pockets have caused the development to be slow and at best spasmodic.

During the next decade Mr. A. C. Hamlin accompanied by Dr. Joseph Leidy returned to Mount Mica, and after removing considerable rocks, they found a large cavity, which contained one exceptionally large achroite crystal. This crystal was said to be "white at the top, changing into a smoky hue towards the base, and assuming a crimson tint when viewed along the line of its axis" (1). The crystal was 4½" in length and 1½" in diameter. Both terminations were tipped with green tourmaline. Later the same year Mr. Hamlin returned and blasted out the rear of the cavity mentioned before, and was rewarded with the discovery of one beautiful watermelon tourmaline crystal which had lain six feet below the surface of the ledge. It was transparent and weighted 6½ ounces.

A mining company in search of mica began operations shortly thereafter and uncovered perhaps the richest and the most beautiful tourmalines of Mount Mica. Most of these were pocketed by the miners and compilation of a complete record of the minerals recovered during this period is impossible. Mr. Hamlin was, however, able to reconstruct a number of the large crystals from fragments.

Mount Apatite

The decade from 1880-1890 evidenced the discovery of Mount Apatite, the second major gem bearing region of southwestern Maine. It is located 4 miles northwest of Lewiston and Auburn. This area was discovered by a boy named Lane who was fascinated by a piece of "green glass" he found there. The "green glass" was soon identified as tourmaline by Dr. Luther Hill.

The first specimens were rich emerald green, and one of these yielded a perfect gem of two carats. In addition to the tourmaline other interesting or rare minerals as aquamarine, quartz, beryl, royal purple apatite, almandite garnets, cassiterite, cleavelandite, amblygonite, mont-

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1 Hamlin, A. C.. *The History of Mount Mica.* Banger, Maine: A. C. Hamlin, 1895.

morillonite, uraninite, and cookeite were found in the gem bearing pockets. The gem bearing pockets were relatively infrequent and were usually located in the coarser parts of the deposit. The pockets were of the order of a foot in diameter, with an exceptional one having dimensions of four by six feet.

This region is probably most noted for its tourmalines and purple apatite crystals, the latter being peculiar to it and from which the locality derives its name. Excavations for the royal purple apatite were carried on at the P. P. Pulsifer Mine. In describing one of the large crystals of this mineral shown them by Mr. Pulsifer, Manchester and Bather have the following to say. "It is a beautiful amethyst color cloudy in portions but in small areas perfectly clear and of gem quality; the crystal measures 3.8 centimeters (1.49 inches) by 4.3 centimeters (1.69 inches) in the horizontal direction and 3 centimeters (1.18 inches) in the vertical and weighs slightly over 100 grams" (2).

Some of the Mount Apatite stones were sold as gems by the Mount Mica Mining Company in the summer of 1884 at Bar Harbor, Mount Desert, Maine. The cut gems were valued as follows:

Tourmalines	$2683.00
Beryl and Aquamarine	1062.00
Uncut specimens	400.00
	$4145.00

In 1887 the yield was much less, $200.00 in tourmalines, and $400.00 in associated minerals. In 1890 $2000.00 worth of fine gems were mined here.

Stoneham

This period evidenced the location of another source of gems in Maine. In 1882 excellent crystals of topaz were found at Stoneham, Maine. The specimens were colorless, or slightly colored with green or blue. Their size ranged from 2/5" to 2½", and they were completely transparent. Two fine aquamarines were found in a pasture near Stoneham in this year. One of these was of sufficient size and perfection to produce a gem of over 20 carats. The other was part of a crystal 5" long and 1" wide.

The beryl locality at Stoneham yielded $700.00 worth of gems and specimens during 1883-1884 with one gem worth $75.00. Many of the beryls have sufficiently "flocculent centers" to be cut into cat's eyes.

Mount Mica Prospected More Thoroughly

Despite these new discoveries, the work at Mount Mica continued. In 1881 Mr. A. C. Hamlin, one of the pioneers of the region, formed the Mount Mica Mining Company to carry on further prospecting here. This year revealed several cavities containing choice gems and specimens, most of which unfortunately had undergone severe weathering and fell to pieces on being moved.

In 1882 *Mineral Resources* reported that the yield of green, blue, pink, and yellow tourmalines from Mount Mica totaled $2000.00. No further report was made until 1885 when work was carried on in June, July, and August with very little success.

In 1886 Mr. Samuel Carter removed some more of the overlying ledge in the rear of the pit to uncover a vast treasure of tourmalines, most of which were broken but restorable. Further blasting yielded two especially large gems, one 34 carats, and one 28 carats. The economic value of this production was $5000.00 in cut tourmalines and $1000.00 in associated mineral specimens. Over 100 crystals furnishing 20 gems were included in this group. Besides the tourmalines, Perry and Bailey found a 7½ carat green chrysoberyl. No further work is reported until 1889-1890 when $2000.00 worth of gems were mined at Mount Mica.

The last period in Maine gem history extends from 1890 to 1916. In 1891 Loren B. Merrill and L. Kimball Stone carried on work at Mount Mica without bringing to light many gems. In 1893 operations were renewed and the first red tipped specimens were obtained, also large green crystals one of which weighed 63½ carats. Total value of the year's operation was $3000.00.

2 Manchester, James G. and Bather, William T., Famous Mineral Localites: Mount Mica and other localities in Maine, *Am. Min.,* Vol 3, Sept. 1918, pp. 169-174.

Miscellaneous Localities

This is the last available information on gem production till the publication of *Mineral Resources of the U. S. for 1914.* The report on Mount Apatite mentioned a few finds of gem quality material. Included in these was a beryl crystal 12" in diameter and 22" long, light pink in color. Most of the crystal was either translucent or opaque, but parts were of sufficient transparency to be used as gems. One of the gems cut from this large crystal weighed 1.2 carats. It was clear and flawless, of light pink color and of great brilliance. Other gems, larger and of deeper hue were also cut from the crystal. The Maine Feldspar Company, finder of the beryl crystal, also reported to Mr. N. G. Smith of the National Survey the uncovering of some purple lilac spodumene, similar to the California kunzite, but lacking sufficient transparency for cutting into gems.

In the same report the newer North Lovell area is discussed. Sugar Hill, 3 miles northwest of North Lovell, has supplied several opaque and translucent specimens of greenish, yellowish-green, and pale golden beryl as well as some transparent material of gem quality. Excellent golden beryls and aquamarines were also reported on the land of Charles Andrews, on Speckled Mountain, in Stoneham, 5 miles northwest of North Lovell. The North Lovell region is the last gem bearing area of some importance discovered in Maine.

The year 1916 marks the beginning of a lull in a rather long period in the history of Maine gems, first, because of the apparent exhaustion of the known deposits and second because of the more abundant production of gem minerals from California and elsewhere. Today Maine continues to provide a small quantity of gem minerals and cut gems, but these are relatively unimportant and are eagerly sought after by collectors and tourists who visit the Pine Tree State.

POTOSI MINE OF MEXICO

One of the famous old mining camps of Mexico is that of Santa Eulalia in the northern part of the country. Discovered in 1703, this camp has been and still is one of the great silver-lead producers of the world; the mines lie adjacent to the village of Santa Eulalia. The most important mine in Santa Eulalia is the famous Potosi or El Potosi mine.

Santa Eulalia is about 12 miles southeast of the city of Chihuahua which is in about the central part of the state of Chihuahua. The city is the capital and largest town in the state and is the center of a very rich silver district. The population of the city is about 40,000.

Geology

The silver-lead ores form replacement deposits in limestone. According to Lindgren[1]: "Two main types of ore are found (1) an older, complex silicate gangue (ilvaite, hedenbergite, fayalite, and chlorite), with argentiferous pyrite and a little lead and zinc; (2) the predominating pyrite, galena, and sphalerite, with lime silicates in minor amount or absent."

Mineralogy

The Potosi mine is famous for its fine minerals and many specimens have been distributed among collectors and museums. Among the extra nice minerals found in the mine are:

Calamine: fine colorless crystals

Embolite: fine greenish masses

Gypsum (Selenite): fine colorless crystals

Mimetite: fine yellowish crystals

Pyrrhotite: in fine dark brown crystals, sometimes tarnished.

Silver: in fine crystals. A most interesting specimen, consisting of delicate silver crystals embedded in a platy selenite crystal, is in the collection of Mr. Arthur Montgomery, of New York City.

Sphalerite: in fine crystals.

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1 Lindgren Waldemar, Mineral Deposits. Mc-Graw-Hill Book Co., Inc., New York, 3rd Ed., 1928, p. 680

FLUORESCENT FURNACE PRODUCTS

BY CHARLES A. THOMAS

706 Church Street, Royersford, Penn.

In a recent issue (June) of *Rocks and Minerals* the writer mentioned the finding of brightly fluorescent slag or cinder massess at Friedensville, Penn. Although the luminous areas are not large and the cinder masses are quite fragile, these present a very bright spot in a display containing willemite which usually dims other specimens by eye comparison, a little understood optical phenomenon noted often by students of fluorescence. It is possible that the cinder masses contain a synthetic zinc orthosilicate.

Since the June article was written, a new and rather beautiful single specimen of fused slagged fire brick was found at Phoenixville, Penn., near the still operating Phoenix Iron works. This melted firebrick with slag adhering to it reacted a very lovely blue somewhat of a truer blue than hydrozincite or benitoite, under the Mineralight. Blues are an elusive color in minerals with any light source but the Mineralight caused certain fused areas in this specimen to react a true blue. No phosphorescence was noted.

Another interesting furnace product worth mentioning is a glassy foam slag found at an active Birdsboro furnace. This unique slag is as light as cork, is somewhat fragile, and reacts at close range under a Mineralight with a reddish brown color. No phosphorescence was noted. No other ultra-violet source owned by the writer induced this material to react.

One of the prettiest banded fluorescent glassy slags was found at the historic Oley Furnace near Reading, Penn. In daylight this glassy mass is grey and green banded. Under the Mineralight these wavy bands react in two tones of dull reddish-orange. Some phosphorescence is apparent to the eyes in certain types of the slag from this old locality but these are not brilliant enough to keep.

Not far from Birdsboro is the old Hopewell Furnace which has been reconstructed for historical purposes. Huge masses of cindery slag containing much unburnt charcoal and soft coal are still visible at this site. A night trip with a portable Mineralight should surely reveal some interesting material from this area. To be sure, the ghost of Benjamin Franklin would be very much interested in the furnace waste now, especially if he could see the varied reaction under ultra-violet short wave. It was there that Benjamin Franklin's one piece iron-hearth was manufactured to his specifications.

The writer recently acquired an extremely brilliant specimen of furnace material from Joe Faussett, a Bronx collector. The exact locality is not known for this specimen. It reacts a lemon-yellow under any ultra-violet light source but is best under the Mineralight. This heavy botryoidal mass contains zinc in some form with probably manganese. Its brilliant reaction lights up a considerable area in a darkroom. It is undoubtedly one of the best acquired specimens in the writer's display.

A true green is another luminous color very rare in fluorescent display cabinets. Of course some willemites react green under long-wave ultra-violet lamps and most react greenish under a Mineralight, but the writer believes he has a fluorescent slag from Phoenixville, Penn., that is an uncontroversial green to anyone's perception. It is a semi-glassy slag, very heavy and very black in daylight. Well defined areas react not brilliantly but definitely green. The same green reaction (Mineralight only) was noted on fused surfaces of fire-brick but the daylight color was copper-sulfate green or blue-green and not the dense black.

Very peculiar orange, lemons and reds on heavy mineral-containing-slag from Phoenixville were noted under a Mineralight equipped with a fresh 986 filter. These specimens are not plentiful but a careful search of the dumps with a portable Mineralight might reveal a few specimens hiding under masses of slag. A soft stalatitic mass of some sort of leached sulfate formed by dripping rain-

water reacts a soft light blue only under the Mineralight. All non-glassy slags from this slag-pile with any fluorescence at all have varying degrees of after-glow.

The apricot crystaled slag from near Boyertown and the flue dust and the all-lamp phosphorescent slags from Pottstown were recently described by the writer in these pages. These furnace products are still the most spectacular ones discovered by the writer. A table-lamp causes after-glow in the Pottstown material.

FLUORESCENT DEWEYLITE

BY W. HAROLD TOMLINSON

Springfield, Penn.

A trip made last fall with my pal, Bill Smith, to Dyers Quarry at Soldier's Delight, Maryland, netted the usual specimens; picrolite, for those who like to get their fingers cut, precious or near precious serpentine which transmits a rich deep green color in thin slabs, magnesite and deweylite. The deweylite occurs as a botryoidal crystalline coating over the magnesite. Lump specimens show deweylite ramifying all through the magnesite vein. I brought a lot of this material home, most of which was thrown out. When sawing some slabs for the preparation of miscroscopic thin sections, it occurred to me to put a piece under a Radarlite short wave. I was much surprised to find that the deweylite fluoresced a bright yellowish-white color. The specimen was quite attractive. In the dark, the deweylite shows as a yellowish-white tracery through the magnesite which appears black. Examined in a dim white light with the Radarlite held close to the specimen, the deweylite shows as a satiny bluish-white tracery through the flat white magnesite. Radarlite examination of deweylite specimens from other localities showed that all specimens of the mineral in my collection fluoresce with about the same color. I have not seen deweylite listed among fluorescent minerals. It should be.

I have recovered most of the material from Soldier's Delight that I discarded and am now sawing it into slabs for my friends and relatives.

Native Copper in Tennessee

Native copper has been found in Tennessee only in the Ducktown area where it occurs in small quantities and found at rare intervals. It is found chiefly in small sheets and bunches but is also known as thin veins in rock.

Ducktown, in the extreme southeastern corner of Tennessee (in S/E. Polk County), is noted for its copper mines.

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Badlands of Mexico

Near the southern outskirts of San Angel and of Coyoacan (southern suburbs of Mexico City) is the Pedregal de San Angel (the badlands of Mexico). These badlands consist of an ancient basaltic lava stream 6 miles long, 2½ miles wide, and from 20 to 50 feet deep.

The Pedregal is a black, irregular and forbidding area, filled with caves which were once the hiding places of bandits. Many legends are still current that these caves contain buried treasure of the former bandits. Searching parties have repeatedly explored the area, discovered numerous caves hitherto unkown, but failed to find any treasure.

The area is so bleak and forbidden that no one except a hardy individual would dare to traverse it alone. Numerous quarries in the basalt cliffs on its outskirts have been opened up to furnish crushed stone for nearby road construction but if interesting minerals have been found in them they do not seem to be recorded.

WINDSOR QUARRY, RUDEVILLE, N. J.

BY PETER ZODAC, Editor Rocks and Minerals

The most interesting limestone locality north of Franklin, N. J., is the abandoned Windsor quarry in the little hamlet of Rudeville. This is a large working and consists of two openings. The first opening is a huge quarry many hundreds of feet long. About 300 feet further is the second opening, a much smaller quarry, approximately 200x220 ft. in area with walls 15 feet high. Both quarries are full of water.

The Windsor quarry must be 100 or more years old and was first opened by one of the early Rudes in the area (after whom the hamlet was named). The limestone was originally burnt for lime but in later years it was quarried as a flux in blast furnaces.

Location

Rudeville is a little hamlet in northeastern Sussex County (in the northern part of the State), about 3 miles northeast of Franklin. The quarry is 0.4 mile northwest of Rudeville and can be spotted easily from a distance. A railroad spur once ran into the quarry but may now be torn up.

Mineralogy

Among the many minerals found at the quarry are the following:

Amphibole (Hornblende): Small black crystals in calcite, crystalline, black; massive, black, with titanite; greenish, bladed with pyrrhotite.

Edenite: Nice crystal, 1" long deep greenish gray..

Apatite: Minute, gemmy, greenish crystals in calcite. Larger crystals, also green, up to 3" in length, have been found.

Arsenopyrite: Small masses and grains have been found with hornblende and pyrrhotite.

Calcite: White, cleavable; white, crystalline; and reddish, crystalline. The white variety is the chief constituent of the coarse crystalline limestone quarried here.

Chalcopyrite: Small crystals in calcite; also small masses with calcite, hornblende, and pyrrhotite.

Chondrodite: Fairly common and of good quality, brownish to yellowish grains in limestone and associated with spinel, pyrrhotite, and pyrite. The mineral resembles norbergite that is found in nearby Franklin but norbergite does not occur in the Windsor quarry.

Corundum: Crystals, some brilliant pink, associated with rutile, were said to have been found here. Some of the crystals were almost transparent.

Fluorite: Purple masses and small crystals in limestone.

Dolomite: Small grayish crystals in cavities in limestone.

Graphite: Very common as small black flakes in limestone.

Ilmenite: Palache[1] states that in a specimen reported to have been found in the Windsor quarry ilmenite occurred as grains and distinct crystals with altered spinel and pyroxene embedded in limestone.

Limonite: Common as small brown, also yellow, earthy masses; also as stains on limestone.

Nephelite (Elaeolite): Reported to occur here in grayish masses but not seen by the writer.

Phlogopite: Nice little bronzy crystals and flakes are common in the limestone.

Pyrrhotite: Nice small dark bronzy metallic masses are common in limestone and often associated with hornblende or with chondrodite.

Quartz: Massive smoky quartz occurs associated with brown tourmaline. Small milky quartz crystals also noted in cavities in limestone.

Rutile: Black slender crystals associated with corundum crystals, also with brown tourmaline.

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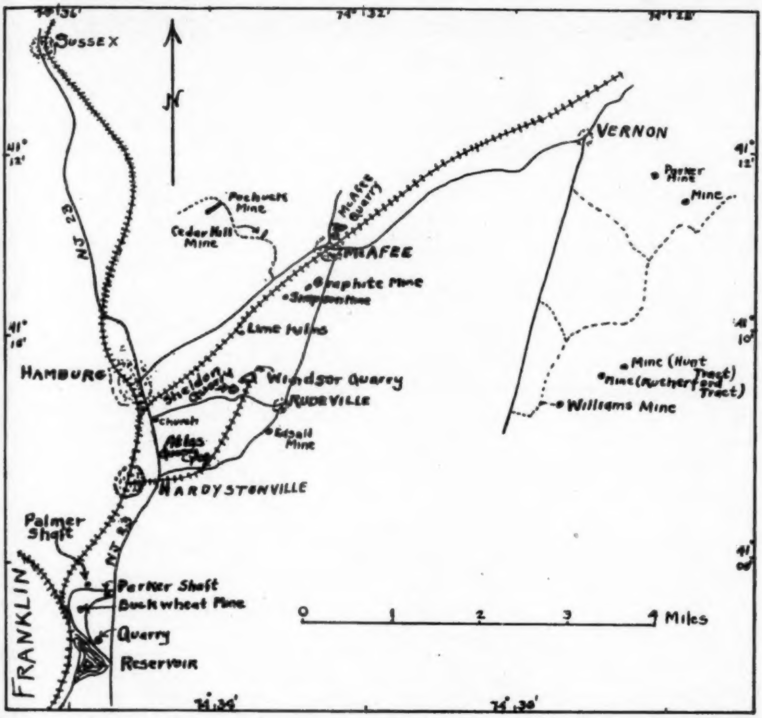
[1]Palache, Charles, The Minerals of Franklin and Sterling Hill; Sussex County, New Jersey. U. S. Geol. Survey Prof. Paper 180, Wash., D. C., 1935, p.42



Sketch map showing location of Windsor quarry and other localities north of Franklin, N. J.

Sodalite: Small blue masses have been reported to occur with nephelite (elaeolite).

Spinel: Black and bluish-purple crystals in limestone. Near the dismantled plant, the writer found (April 18, 1937) a large mass of chondrodite in which were many small black octahedrons of spinel associated with pyrite cubes and small masses of pyrrhotite.

Palache[2] reports: "At the Rudeville quarries, brown crystals of spinel, with chondrodite, were at one time abundant."

Serpentine: Grayish-green, slickensided masses on dark brown tourmaline were found by the writer on April 18, 1937.

Titanite: Small masses with hornblende; small masses associated with phlogopite and pyrrhotite; also small wedge-shaped crystals embedded in black hornblende. All titanites at the quarry are chocolate-brown in color.

Tourmaline (Black): Crystals, sometimes up to 4x8 inches in sizes, have been found.

(Brown): Many good crystals of brown tourmaline, some quite large, used to be abundant in the Windsor quarry. They were often associated with calcite, graphite, and other minerals.

Wernerite: Occurs as long, grayish crystals in limestone.

The Windsor quarry is a great locality and many interesting minerals can still be found on its dumps. At the south end of the main quarry note the dark gray fine grained trap dike; the rock is camptonite (resembles diabase) and is about ten feet in thickness.

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[2] Palache, Charles. Work cited. p.43

THE BUCKSHOT BARITE MINE OF CENTRAL MISSOURI

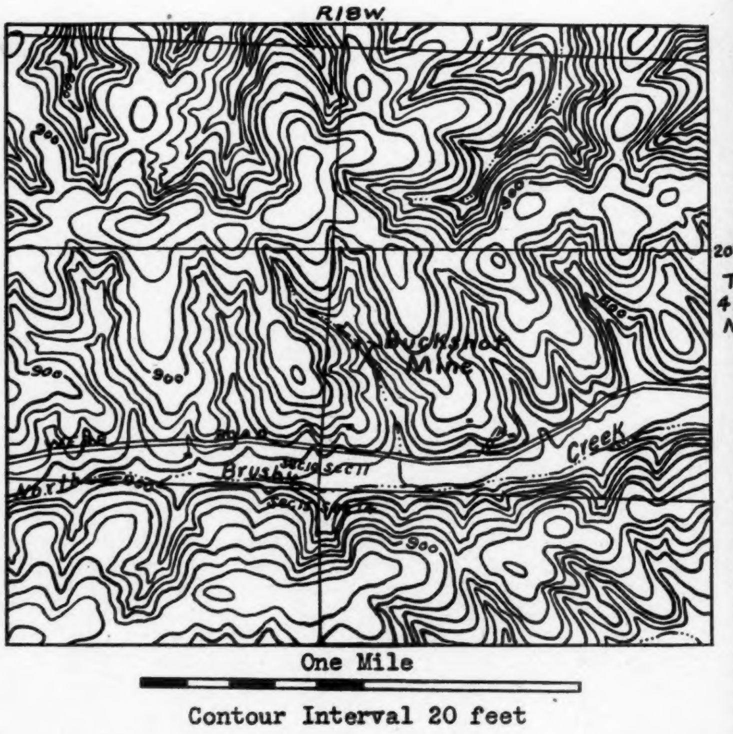
BY ALBERT L. KIDWELL

Geologist, Missouri Geological Survey and Water Resources

The Buckshot Mine is in southern Morgan County, Missouri, about four miles northwest of Gravois Mills. The exact location is the NW 1/4 SW 1/4 sec. 11, T. 41 N., R. 18 W.

Morgan County is near the center of a group of nine counties in Central Missouri which has produced considerable barite, lead, clay, coal, and some zinc. Lead was mined as early as 1858, but little attention was paid to the other minerals until after 1900. The mineralization occurs chiefly along solution openings in Cambrian and Ordovician dolomites. Many of these are known as "circle" and "filled-sink" deposits and consist essentially of caved and partially caved caverns in which the ore minerals were later deposited. At present the barite deposits are the most important, with some galena and sphalerite being concentrated as a by-product. A large number of shafts and pits have been opened in this region, and those in Morgan County are fully described in a forthcoming report of the Missouri Geological Survey.[1] Many of these are not worth visiting as a source of mineral specimens;

1 Mather, W. B., Mineral deposits of Morgan County, Missouri: Missouri Geological Survey and Water Resources. Rept. of Inv. No. 2, 1946.



Location of Buckshot Mine. (From Proctor Creek Quadrangle, U.S.G.S.)

but others yield interesting and showy specimens, chiefly of barite.

At the Buckshot Mine, all of the work has been done in two open pits on opposite sides of a small ravine. The mine was opened in 1938 and the last work was done in 1943. The best specimens are found in the eastern workings.

Barite is the predominant mineral found here. In the east pit is occurs primarily as white to colorless crystals (glass tiff) on massive barite (ball tiff). The crystals vary in size from a fraction of an inch to six inches in length, and both tabular and prismatic shapes occur. The crystals have grown in open solution channels in the Gasconade dolomite country rock and the remaining openings have been filled later with a sticky red clay. No perfect doubly-terminated crystals have been found, indicating that the barite crystallized before the red clay was formed. The country rock is highly decomposed, making the collecting a matter of digging around the openings with a pick and then breaking off whatever size group of crystals is desired. Many single crystals have been broken loose from the walls by weathering and incorporated in the clay. In the west pit the barite is all the "ball tiff" variety.

Galena occurs as rough crystals in the barite, and cleavable masses several inches across are not uncommon.

Chalcopyrite is found as small crystals in barite near the contact with the wall rock. In most cases it has oxidized to form a malachite stain.

Calcite is present as coarsely-crystallized masses which were deposited in some of the openings later than the barite. No complete crystals were found but good cleavages may be obtained.

This mine is one of the best localities in Missouri for collecting clear barite crystals. It is not being operated at the present time and permission is not required to enter the property.

UNUSUAL FIND AT PROSPECT PARK, N. J.

During the week ending August 17, 1946, there was a blast in the east wall of the basalt quarry at Prospect Park, N. J. It is only on rare occasions that a blast is made there. Also, blasting is no longer carried out on most of the West wall, because of its closeness to residences, and it is in one section of the West wall where most of the lovely amethysts, datolites, and golden calcites were found some years ago.

The writer happened to look over the blast on the east wall, which location has never been a good hunting ground for gem quality minerals, and made an unusual find. This took the form of a delicate milk-white perfect cone, 1½ ins. high and 1¼ ins diameter at the base. It is covered on the outside and lined on the inside with thousands of minute faceted quartz crystals, and on the outside is studdied with 68 pale green prehnite balls of about ⅛ in. diameter. Its thickness is only one-sixteenth of an inch.

This cone was in a cavity in very hard trap rock, and the cavity itself was lined with prehnite. In trying to chisel out the cavity, the rock split in several places across the cavity but the cone, which had grown inside, was saved undamaged.

Same deep violet amethysts were also found there by the writer, and while some of them were "faceted," they were not of gem quality. A boulder weighing about 50 lbs was full of them.

Over on the West wall near the North end at a place where no blasting had been done for some weeks, the rains had evidently caused a boulder in the wall to drop. The writer turned the big rock over to find one side, about 15 in by 9 in. in area, covered with good size pale green datolite crystals, mostly "faceted," but not gem quality. By careful chiseling he was able to break away a piece about 6 ins by 4 ins. Datolites have a tendency to fall out from the matrix when the rock is hammered, as did most of these except on the piece which was saved. Incidently, datolites now are only rarely found at Prospect Park, which no longer is a rock hunter's paradise.

ASHIO, JAPAN, COPPER MINES

The largest copper mines in Japan are located at Ashio and have been worked for hundreds of years. They are noted for their large number of interesting minerals, many of which have found their way into America and other countries. Some few years ago an American, a member of the Rocks and Minerals Association, residing in Yokohama, visited the locality and obtained some specimens, a number of which were sent to the Editor of *Rocks and Minerals*. These specimens were of good quality and the notes sent with them of interest and so this article was prepared. Before we had a chance to print the article, however, war broke out and it was set aside.

Part of the notes sent by the American are as follows:

"In regard to Ashio, I recall with chagrin my trip to that copper region, due to the fact that the police of that locality stopped us on three occasions and asked us a host of questions—why we came?—etc. and then the place is the last place to go to for Ashio minerals. It is a place of about 35,000 inhabitants, mostly miners and their families.

"I was told by the people that the town was full of mineral shops. Well it was, but about 30 years ago. We found only one and what prices! One would think that gold was being sold. We floundered about, finally we came to the mines proper. All we saw was the outside, no permission to enter. Everything is under cover, even the shafts that lift the ore out of the mine.

"The surrounding hills are devoid of vegetation, no doubt due to the volume of sulphur fumes pouring out of the chimneys of the smelters.

"The people of the village where we settled for lunch inquired why we came and as soon as they understood, they loaded us with minerals and would not accept any money. This is a truly Japanese characteristic, politeness and kindness met with everywhere. The unpleasant side which I mentioned above is rare. Of course officials have their orders and perhaps they carry them out too strictly at times.

"Here are a few facts about the copper mine gathered mainly from a guide book for foreigners. The book was published in 1914, that is about 25 years ago.

1st. Ashio copper mine was worked in the early 17th century.

2nd It passed into the hands of various clans or families.

3rd. The area mined is 2040 acres in extent.

4th. Already in 1914 about 8,000 tons of copper ingots were extracted.

5th. There are three entrances—north, south, and west.

6th. Cables, shafts, trolleys, and other up-to-date appliances are in use.

7th. The region is entirely volcanic.

8th. In former days the outcroppings must have been considerable as surface mining was practiced.

9th. The place is about 90 miles directly north of Yokohama.

10th. There is no auto nor any direct road to the place.

11th. A tortuous and very scenic narrow-gauge railroad is the best way of getting there.

12th. The region is elevated, about 3,000 feet, and is very mountainous."

History

Ashio is the general name given to a number of small hamlets or villages in a district of Japan famed for its copper mines worked from the early 17th century. The Ashio mines are considered to be the largest in the Far East.

Four mines are worked: Honzan, Tsudo, Kotaki, and Sunoko-bashi. The greatest distance between any of the mines is about 2½ miles and all are connected by rail.

It is apparent that at the time of our member's visit to the locality, the Japanese government was preparing for war and thus had a huge number of miners working and the mines well guarded by police.

Location

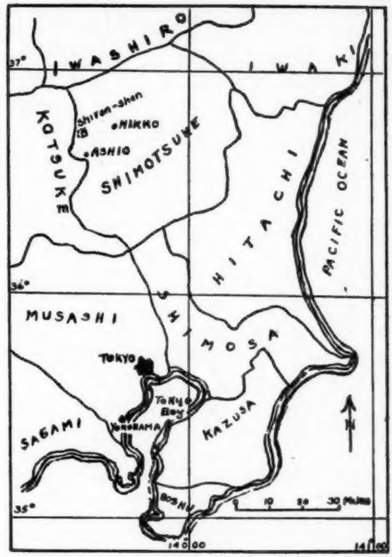
Ashio is in the extreme western part of Shimotsuke province, about 2 miles from the eastern border of Kotsuke province. It is 72 miles northwest of Tokyo, 85 miles almost due north of Yokohama, and 75 miles west of the Pacific Ocean. Its location may also be given as in the eastern part of Honshu Island, the largest island of the Japanese group. Furthermore the geographic location of Ashio is 139° 22' E.Long., and 36° 40' N.Lat.

Ashio, which lies at an elevation of about 2,300 feet, is in the Watarase Valley on the west bank of the picturesque Watarase-gawa (Watarase River). Nikko, a famed summer resort, is 11 miles northeast of Ashio.

Geology

The ore, chiefly chalcopyrite, occurs in a matrix of clay, calcite, and quartz. The veins vary from 6 inches to 20 feet in width—some being over 1,000 feet in length.

According to Weed[1]: "The district consists mainly of Paleozoic sediments and Tertiary liparite (rhyolite). The liparite forms a volcanic neck erupted through the Paleozoic sedimentary rocks and is 2 miles in diameter. The ore deposits of Ashio occur in veins most of which traverse the liparite. The strike or course of the veins is either N.60 E. or N.80 W. The mines have more than 200 veins. The chief minerals are chalcopyrite and pyrite, with accessory amounts of zinc blende, arsenopyrite, galena, and pyrrhotite. Bornite, chalcocite, cuprite, malachite, pisanite, and sometimes azurite and native copper are found in the oxidized zone. The gangue minerals are found in small amount; clay and chlorite are common, quartz is also common, and calcite is found at deep workings. Native bismuth, bismuthinite, wolframite, fluorite, crystallized vivianite, ludlamite, and apatite are rarely found."



Sketch map of eastern Honshu Island (Japan's largest island) showing location of Ashio in western Shimotsuke Province.

Mineralogy

In the preparaton of this article, Wada's "Minerals of Japan," 1904, and 1905-15. (both published in Tokyo) have been consulted. In the text we shall designate them as Vols. 1 and 2.

Among the minerals occurring in the Ashio mines are:

Anorthite: Good porphyritic crystals in an agglomerate are found near Ashio.

Apatite: Colorless, transparent, platy crystals associated with quartz crystals, chalcopyrite crystals, and other minerals. At the Kotaki Mine, apatite crystals are found attached to chalcopyrite crystals and associated with pyrite and calcite crystals.

Arsenopyrite: Massive

Azurite: Drusy, dark blue encrustations on chalcopyrite.

Bismuth: About 1907, native bismuth and bismuthinite were first collected in the Kaisei vein in the Ashio mines by

1 Weed, Walter Harvey, *The Mines Handbook. P*ublished by W. H. Weed, New York City, 1918, p.1748.

Fukunosuke Yamada, a mining engineer to the mines. Both are found in individuals, always without crystals faces Those of the former attain 3 cm.in diameter and those of the later 5 cm. The bismuth well shows the trace of rhombohedral cleavage on the more of less curved cleavage lamellae, parallel to the base. The bismuthinite is partly rounded on free edges as if it has been partially attacked by the action of heat or of a solvent. The rounded edges shows a crystalline appearance. (Vol. 2, p.261)

Bismuthinite: See bismuth .

Bornite: Massive, associated with chalcopyrite.

Calcite: A number of fine crystals have been found among them are groups of columnar crystals, white in colour, and sometimes coated with a gray substance; flat crystals, white with a reddish tinge, steep rhombohedral crystals, grayish white with a reddish tinge; scalenohedron crysals, grayish white with a green tinge; beautiful needles, clear and colorless; a cotton-reel form, consisting of two hexagonal plates and one hexagonal prism. Color white. Vol.2,p.277

Also white, nailhead crystals on group of rock crystals.

Chalcocite: Massive, associated with chalcopyrite.

Chalcopyrite: Massive, lustrous, tarnished. Also found as small crystals associated with apatite, calcite, and quartz crystals.

Copper: Sometimes in small crystals whose faces are not well defined.

Cordierite (Iolite): Occurs as a contact mineral; it occurs in hexagonal columns, about 10 mm. in diameter in metamorphosed slate. The greater part of it is decomposed into white opaque masses. (Vol. 1, p. 119)

Cuprite: Massive

Fluorite: Sometimes occurs with chalcopyrite in the Ashio copper mine. It forms here minute octahedral crystals, about 2mm.in diameter, and is translucent and colorless or of a light green color. (Vol.1,p.56).

Galena: Isuzu Sugimoto, a mining engineer at the Ashio mines, has found a small specimen of a druse of flat galena crystals in the Shijuninen-hi level in Kotaki, in the Ashio mines. To the main crystals are commonly attached smaller individuals, either in parallel growth or making polysynthetic twins. Vol.2,p.262

Gypsum: At Kotaki in the Ashio mine, it appears in slender columnar crystals, colorless and transparent, attached to chalcopyrite and pyrites. (Vol.1,p.80)

Laumontite) In 1909, a vein composed of laumontite only was discovered in the liparite, which forms the country rock of the Ashio Copper Mines, in the province of Shimotsuke. The locality of this find is the northern part of the Honzan mine in Ashio, where the laumontite is found in druses of siender crystals of excellent transparency. In some specimens, straw-colored calcite crystals are associated. The faces of the laumontite are well developed, for there are ample spaces between the indiviuals. The fresh specimens are perfectly colorless, but they become white on exposure to the air, and then easily crumble at the slightest touch.. (Vol.2,p.190)

Ludlamite) Small green crystals.

Malachite: Massive.

Manganite: In black platy crystals associated with chalcopyrite crystals and drusy quartz.

Pisanite: In bluish stalactitic masses.

Pyrite: One of the ores of the mine and found chiefly in massive form associated with massive chalcopyrite. Interesting specimens are crystallized masses of interpenetrating cubes.

Pyrrhotite: Massive.

Quartz: Massive, drusy, and rock crystals. Some of the crystals, though small, are very nice.

Siderite: Found in aggregates of minute brownish crystals.

Sphalerite (zinc blende): Massive.

Vivianite: Beautiful crystals were once found at Ashio. They were at first light blue, but became darker after exposure. The crystals are prismatic in habit and irregularly grouped. (Vol.1,p.86).

The occurrence is observed in copperpyrite veins through liparite, partly in good crystals and partly as individualized pieces. The crystals surpass 14 cm.

in length and 3 cm.in width. They look either colorless or greenish-blue, and are all transparent. But the color of the cleavage pieces and imperfectly developed crystals are deepened on exposure in the air; the powders and streak turn speedily blue. The crystals are naturally curved or bent in a zigzag manner. Vol.-2,p.299)

Wolframite: At Ashio, wolframite occurs in association with quartz and chalcopyrite, in thin lamellar crystals about 7mm.wide, and of a high metallic lustre. It is here found only aparingly. (Vol.1, p.77)

Rocks and Minerals Folks Are The Finest People!

Editor R. & M.:

We are wondering now why on our previous motor trips throughout the States we had failed to have with us the names and addresses of mineral collectors and dealers. On our last trip, made this summer to Michigan, we had such a list and though we had time to contact but two, it would have been well worth the trip had we seen nothing else. Of all strangers that we had met, the Rocks and Minerals folks were the finest. There seems to be an unusual interest and cordial welcome from the first introduction.

The day after our arrival in Detroit we phoned Donald Gabriel, whose name and address you had given us, and he immediately extended a very urgent invitation to call on him and to see his collection. He and his mother live alone at 14564 Grandmont Road. We accepted the invitation and spent with them one of the most pleasant evenings of our lives.

Mr. Gabriel has the finest collection of museum specimens we have ever seen. A large proportion of his cabinet specimens are fluorescent and many are phosphorescent. He has his lights so arranged that they bring out the colors in the most beautiful way imaginable. He is somewhat of a mechanic and has built his own lapidary outfit and is rather skilled in operating it. He is also a skilful performer on the piano. Like all rockhounds, therefore, Mr. Gabriel is very interesting. His mother, who is more interested in minerals then she perhaps will admit, is also very entertaining.

The second collector visited was Earl Martin, 1884 Miller Ave., Ann Arbor, Mich., and we received the usual warm welcome so common with rockhounds. He and Mrs. Martin each have a mineral collection—that of Mrs. Martin, of course, being the most attractive. Mr. Martin is also a dealer in minerals.

Mineral collectors, if you are planning a tour, take with you as many names and address of collectors and dealers as you can and visit them and thus add double pleasure to your trip and perhaps bring home a few extra trophies.

Dr. and Mrs. W. J. Shacklette
Hodgenville, Ky.

Aug. 13, 1946

Zoisite in Pennsylvania

Zoisite is an orthosilicate of calcium and aluminum and most commonly of a grayish color but brownish, greenish, and pinkish to rose-red colors are also known. As the aluminium in zoisite is often replaced by iron, the mineral grades towards epidote and if enough iron is present it passes into epidote. Thus zoisite may often be mistaken for epidote.

Zoisite has been known to occur in Pennsylvania for over 100 years—its first occurence in the state was near Philadelphia where it was found in grayish acicular crystals in hornblende rock.

Nice specimens of zoisite have been found in Chester, Delaware, and Philadelphia counties but the most beautiful have come from Deshong's quarries in Leiperville, Delaware Co., where rose-red variety (thulite) occurred in masses associated with yellowish grossularite garnet crystals.

Display of Minerals and Gems in New York

The Brazilian Government has a display of gems and minerals at 551 Fifth Avenue, New York City, and it can be seen by anyone interested. In addition to commercial ores there are hundreds of crystals and broken crystals of tourmaline, aquamarine, topaz, rose quartz, blue quartz, crystal quartz and amethysts. As regards cut specimens of Brazilian gems, Joseph Zollman, Room 1104, 16 West 46th Street, New York, 19, N. Y., has a large stock. Mr. Zollman's father operates a large agate cutting and polishing plant in Brazil.

The Amateur Lapidary

DOUBLE CABOCHON BANGLE

BY LUCILLE SANGER

1922 Newport Avenue, Chicago 13, Illinois

Charm bracelets have never been more popular than they are today, and they are to be had in all materials from the very cheapest commercial metals to solid gold. Soldiers coming from foreign lands have made coins of foreign money very popular as charms to hang from a chain. Single large coins fastened to a chain are fashionable right now. However, probably the most satisfactory bracelet to wear is one made by the wearer or by a friend of the wearer.

Herein shall be discussed the method for making a transparent double cabochon charm—that is, a stone set in a silver frame with a cabochon appearing on each side. See Figure 2. The stone used should be more or less transparent, but may be colored ones such as the synthetics, but it must be hard. Setting a stone into this type bezel is not easy on it so the stone must be hard enough to withstand the extra pounding. Patterned stones such as Montana moss, banded agates (except Lake Superior and Iowa) are good. A Sweetwater with a clear ground and well defined moss sprays would be ideal. Any carnelian or chalcedony with a banded or hammered effect, or just clear, is very good.

If a patterned stone is used the cabochon should be cut low, but if a plain stone is chosen, then the cabochon should be cut higher to bring out the beauty of the stone. See Figure 1. In either case there will be a sharp ridge around the edge of the stone and the bezels will fit on either side of the ridge.

Select a template a little large than a quarter and draw around it on the stone slab. Cut and polish the stone.

Using the template, draw around it on twenty gauge sterling. Saw out this circle but keep the saw just outside the line. This is to allow for the thickness of the bezel. Now draw an outer circle around this making a rim just a little wider than a quarter of an inch. This will allow for truing up the edge. Perhaps a rounded file will have to be used here and there on the edge of the center circle to true the edge.

If a patterned stone is selected, leave the rim of the circle plain, but if a plain stone, either colored or clear is chosen, then the bezel may be decorated. It is not advisable to use twisted wire, at least when making the first ones of these as the wire will get in the way when setting the stone. Balls will also interfere with setting the stone. Hammering the frame can only be done on one side, as when it

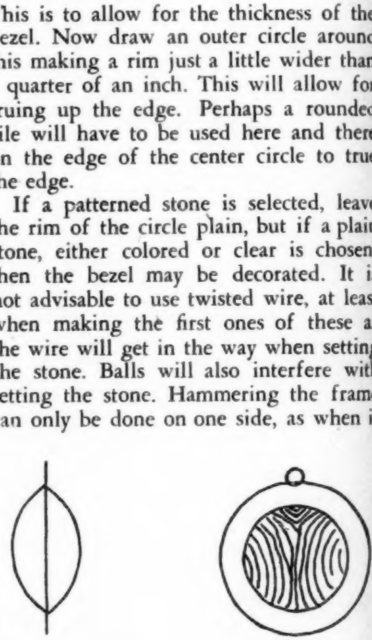


Fig. 1 Side view Fig. 2 Front view

is turned over and hammered on the other side, the first hammering nearly all disappears. However, the edges may be scalloped or a pierced design executed or a combination of both used.

Cut a strip of twenty-six gauge sterling long enough to fit around the template. Smooth it around the template until it forms a circle. Now slip it into the central circle so that half of it stands out on each side. Unless the worker is one of a very small number of expert sawyers, there will be gaps here and there between the bezel and the inner edge of the circle. See that the edges of

the bezel are properly fitted together. The circle will hold them in place of binding wire. Heat the silver slightly and flux well. Place solder in the gaps, if any.

Make a ring of eighteen or twenty gauge wire and have it ready to solder on when the bezel is finished.

Heat the piece until the solder flows. Examine it for openings. If any occur flux them, heat the piece and use the point to place the solder where needed.

Now lightly file a small spot on the edge of the frame so the ring can be soldered on. At the joint of the ring, file a tiny flat place on the outside so that it will fit well at the clean spot on the edge of the circle. Leave the ring about an inch away from the circle and just in front of the solderer. This will make it possible to throw the flame onto the large piece and avoid melting the ring. Flux both pieces well. Pass the torch over the large piece and place a piece of solder at the spot where the ring will join the frame. Heat slightly so that the solder will stay in place. When the large piece is ready, use the point to move the ring into place and by that time the ring will be hot enough. Use a large enough piece of solder so that the ring is on very firmly.

A commercial chain may be used but a handmade one will look much better. If a handmade one is used, make it of sixteen or eighteen gauge wire. A nice pattern for this chain is to put oval links about three-eights or a quarter of an inch long together with round links about three-sixteenths inch long.

When the chain is completed, slip one of the oval links into the ring on the circle and into one of the small links on the chain. Solder. Put the piece into warm pickle. Remove and do any filing and cleaning necessary. If a low cabochon is used, some of the bezel may need to come off.

The problem in this project is the setting of the double cabochon. This is not easy and the first effort may look quite crude. It is the sort of thing which will bear practice. However, this should not deter one from making this type of ornament.

Place the stone in the circle so that the edge of the stone is even with the frame. If the stone is patterned, see that the banding or pattern is in pleasant relationship to the top of the bangle. which is where the ring is fastened. If, as is quite possible, the stone is a trifle large, take it down with a piece of carborundum stone, Scotch stone or hone. When a good fit has been obtained, the stone is ready to set.

Find a smooth and solid piece of wood about an inch thick. Drill a hole in it with a Fostner bit. This is a drill which has a blade and which makes a hole having a flat bottom. Make it deep enough to hold the stone and let the silver rim of the circle rest on the smooth wood at the edge of the drilled hole. Now tap the bezel around once on one side and turn the piece over and repeat on the other side. Work first on one side and then on the other until the stone is securely set. The stone will need constant adjusting until it is fairly tight. When setting a low cabochon, work from the bottom of the bezel until it lies smoothly against the stone.

When the stone is set, use a burnisher to remove marks and then polish with white diamond and finished with rouge. Wash in warm suds, rinse and dry with soft cloth. The bangle is ready to wear.

Uranium Exhibit

(*Continued from page 567*)

us that in this exhibit our friend Jack has presented a brief, and readily understood resume of a most interesting field of mineralogical knowledge. It is no wonder the exhibit proved to be the center of great interest.

And we almost forgot to say that all the material exhibited was from Jack's private collection, representing a gradual accumulation of the last several years.

(Jack Boyle is the Mineralogist at the Children's Museum, Brooklyn, N. Y.)

Club and Society Notes

Wellesley Mineral Club

On March 28th past, the Wellesley Mineral Club met in the Geology building at Wellesley College and enjoyed their visit as a group to the noted Johnson mineral collection.

A business meeting followed, which included election of officers for the current year as follows: Mr. M. D. Bogart, Pres., Mr. John A. Seaverns, Vice Pres., Miss Alice M. Dowse, Secy.-Treas., and Mrs. Charles M. Worley, Chairman of Program and Field Trips Committee. Subsequent monthly meetings were since held at the residences of Mrs. Charles M. Worley, Miss Louise Kingsley of the Geology Department of Wellesley College, and Mr. M. D. Bogart, all of Wellesley, Mass.

Club by-laws were enacted and the Club meetings are now regularly held on the third Thursday of each month except July and August, when field trips will be substituted. Club meetings to date covered discussions of minerals and geology, including various locations, by the members. The Wellesley Mineral Club held its first field trip on Sunday, June 9th, visiting and prospecting the recently worked Gillette Feldspar Quarry at Haddam Neck, Conn. The trip was made in private cars and the picnic was enjoyed by the members. On the afternoon of the same day, the Club visited the famous Strickland Quarry, and Schoonmaker Mica Mine, at Portland, Conn., both noted for their remarkable mineral specimens and gem material. Later in the afternoon the Hale Feldspar Quarry nearby was visited, where some very fine fluorescent minerals were collected.

At the June 20th meeting at M.D. Bogart's residence in Wellesley, Miss Louise Kingsley and Miss Alice M. Dowse of the Geology Department of Wellesley College showed projected Kodachromes pictures of various National Parks and western U.S. locations with an appropriate lecture on the minerals and the geological formations of the areas covered. This was highly interesting, informative and enjoyed by all. The Kodachromes were superb for subjects selected and composition.

The Club''s next field trip will go to several locations in Rhode Island which will include Diamond Hill, the Old Copper Mine (where Paul Revere removed copper ore), and Iron Mine Hill Quarry (where Roger Williams was first to attempt to smelt the magnetic iron ore), all in the Cumberland district.

M. D. Bogart, President

Central Iowa Mineral Club

A regular meeting of the Club was held on Aug. 2, 1946, at the Y.M.C.A., Des Moines, Iowa. The speaker was Paul M. Work, whose subject was "Geology of the Des Moines area."

Los Angeles Mineralogical Society

Mr. Victor M. Arciniega, mining engineer and geologist, delivered a very interesting talk to the Los Angeles Mineralogical Society at its monthly meeting on July 18th, 1946. The subject of his talk was "Megascopic Determination of Rocks" in which he gave three general classifications to rocks namely, Igneous Sedimentary and Metamorphic. Mr. Arciniega showed how important it was for the mineralogist to know these classifications in identifying his rocks. Igneous rocks are those formed from the molten part of our earth and may be either intrusive or extrusive depending on their position in the earth's crust. The dark minerals in these rocks cool first in their formation and the light minerals last. The dark minerals are ferro-mag-rocks; the light ones generally feldspathic.

Sedimentary rocks are those formed by natural forces and may have a mechanical or chemical origin. Those of mechanical origin are products of weathering and may be water, ice or windlaid and residual. Those of chemical origin usually come from solution by concentration and some will have organic intrusions. In this class of rocks are included many of the minerals of particular interest to the mineralogist.

Metamorphic rocks are those literally reconstructed from igneous and sedimentary rocks and high temperatures, pressure and combustion play their part in the formation of same. They may be laminated where parallel orientation of minerals takes place due to dynamic forces or non-laminated where they are compact or streaked, the gneisses, schists and slates are all included in this classification.

A. G Weigel, Pub. Chm.

Worcester Mineral Club

"Paul H. Steele, curator of astronomy at the Worcester Natural History Museum, (Worcester, Mass.) meteorologist and director of the museum's adult evening school classes, was honored at a farewell party on the night of July 16, 1946 at the museum by the Worcester Mineral Club. Mr. Steele left at the end of the month to make his home in Pasadena, Calif.

George L. Carey presented a purse to Mr. Steele, on behalf of more than 25 members attending. Hosts were Mr. and Mrs. Raymond G. Newman and Mr. and Mrs. Carey. Mr. Newman presided.

Mr. Steele distributed to club members items of his mineral collection. Evert Pearson showed motion pictures of outings of the Astronomy Club and pictures of Worcester Parks".

(Miss) Susan G. Ayres
Secretary

Mineralogical Society of Arizona

The Mineralogical Society of Arizona closed its 1945-46 season with an end of the year party at the Arizona Museum, in Phoenix, on May 16th.

A Mineralight was presented to the retiring secretary, Humphrey S. Keithley, who, after several years of very active participation in the affairs of the Society, left Arizona for his native Tennessee. Mr. Keithley's new address is 81 Elm Street, Covington, Tennessee.

At the close of the season the MSA had a paid up membership of 234, which puts it near the top of the list in Mineral Societies and as far as can be determined, it is the largest mineral club in the United States.

The organization meets on the first and third Thursday of each month, (October, through May), at the Arizona Museum in Phoenix. Informal meetings are held during the summer months. Visitors are always welcome. The society's mailing address is P.O. Box 902, Phoenix, Arizona.

Officers elected for the 1946-47 season are:
Arthur L. Flagg, President.
Dr. G. G. McKhann, Vice-President.
H. B. Holloway, Treasurer.
Geo D. Hough, Sec.

New Jersey Mineralogical Society

A field trip was held by the Society on July 27, 1946, to Crystal Hill near Stroudsburg, Penn., a locality noted for quartz crystals.

Maine Mineralogical & Geological Society

The 3rd field trip of the Society for the season was held on July 28, 1946, to Nevel's quarry, Hall's Ridge, Newry, Me., a locality noted for pegmatite minerals.

Wisconsin Geological Society

A field trip and picnic was held by the Society on Aug. 4, 1946. The Cave of the Mounds at Blue Mounds, was visited and also a lead mine at Dodgeville, the picnic was held in Tower Hill State Park; all localities are in southern Wisconsin.

Northern California Mineral Society

Four meetings of the Society were held during July, 1946. On July 12th, a business meeting was held. On July 17th, general meeting held in the Public Library, San Francisco. On July 19th, a micromount meeting. On July 26th, a lapidary night.

Lloyd M. Demrick is president of the Society.

Yavapai Gem and Mineral Society

J. Bryant Kasey, owner of the Prescott Engineering Company, discussed the origin and occurrences of diamonds at the July, 1946, meeting of the Yavapai Gem and Mineral Society, Prescott, Arizona.

The society closed its first year of successful activities with nearly fifty charter members and elected the following officers for the coming year: Alvin A. Hanson, Pres.; A. De Angelis, Vice-Pres.; Ida Smith, Sec., Box 1084, Prescott; and Moulton B. Smith, Treas.

Ida Smith, Sec.

Los Angeles Lapidary Society

The Los Angeles Lapidary Society held its regular monthly dinner meeting on the first Monday in August, at the Police Academy in Elysian Park.

Leland Quick, historian for the Society, spoke on the past year's activities, under the leadership of A. B. Meiklejohn, retired president.

Plans are being formed for the 1947 public exhibit, although this year's show has been over only a short time. There should be a marked improvement over this year's exhibit as we have learned much from discussion and printed shop notes on methods, short cuts and materials.

The Society publishes a monthly Bulletin relating to the activities of the current month, subject of lecture, names of monthly exhibitors, winners of the raffle and a "Gossip Page". Materials for sale to members, and books in our library, are sometimes listed.

Our president also has his own page in which he expresses his aims and hopes.

E. Grace Peters
(Publicity Chairman)

Monterey Bay Mineral Society

Here are the notes from our July meetings; held at the Y.M.C.A., Salinas, Calif.

We showed the Bureau of Mines sound film entitled "ARIZONA — ITS MINERAL RESOURCES AND SCENIC WONDERS".

A. L. Jarvis of Watsonville and Charles Murphy of Los Gatos who attended the Federation of Mineral Societies in L. A. reported on it.

We elected the following officers for the coming year:

President, T. G. Emmons of Salinas; Vice-Pres., A. W. Flippin of Salinas; Secretary, A. L. Jarvis of Watsonville, Treasurer, Alice R. Everett of Santa Cruz; 3rd Director, D. E. Perry of Salinas.

1st and 2nd Directors elected previously and still functioning: H. M. Samuelson of Salinas and R. L. Dey of Salinas.

Jane B. Flippin
Retiring Secretary

Pacific Mineral Society

A dinner meeting of the Society was held on August 9, 1946, at Scully's Restaurant in Los Angeles, Calif. The speaker was Victor M. Arciniega, Consulting Mining Engineer, whose subject was "Origin of minerals".

Mrs. Karlsson Returns to Sweden

Mrs. Ester Karlsson-Ygger, widow of the late Albert Karlsson-Ygger, who died in New York City on May 14, 1945, sailed from New York City on the S.S. Kanangoora, on July 19, 1946, for her native Sweden. After many years residence in New York City, her future home will be in Lemartsfors, Sweden.

. . . With Our Dealers . . .

Chas. E. Hill, of Phoenix, Ariz., announces that he is sold out for 5 months—watch for his new ad in the November issue.

Lionel Day, of New York City, has some summer bargains. Look them up!

If you are in need of some lapidary items, the Utility Supply, Inc., of Topeka, Kans., may have them.

The Omaha Scientific Supply Co., of Omaha, Nebr., has a wide stock of geological supplies.

John L. James, of Tonopah, Nev., has some superb quality gem stones.

E. Mitchell Gunnell, of Denver, Colo., can supply fine specimens of metallic minerals.

Want to buy an established gem and mineral business? Contact Jess Abernathy, of the Topaz Gem Co., Salt Lake City, Utah.

A. J. Alessi, of Lombard, Ill., is featuring another color parade of minerals.

The Shumaker Products Co., of Sterling, Ill., has midget gem drilling machines. Send for a circular.

Frank Duncan and Daughter, of Terlingua, Texas, can furnish some fine fluorescent minerals, select gem agate, and unusual calcite xl groups.

The Erskine Collection, of La Jolla, Calif., has in stock some remarkable rainbow onyx, also other varieties.

Hurray! Another Exhibition-Sale of choice mineral specimens will be held in New York City. The exhibitor will be John S. Albanese, of Newark, N. J. Date Oct. 11 and 12. Mr. Albanese is planning another Exhibition-Sale for July, 1947, for the benefit of out-of-town vacationists.

Fine attractive minerals are featured by Burminco, of Monrovia, Calif. Order them all!

E. W. Suring, the Mineral King of Hollywood, Calif., is a new advertiser. His ad will surely interest you.

Another new advertiser is the Lay-Art Gem Shop, of Boise, Idaho, who can supply Idaho gem minerals.

Some choice Nevada minerals are advertised by Lincoln Hobby Shop, of Santa Monica, Calif.

Long Beach Mineral and Lapidary Supply Co., of Long Beach, Calif., announce their moving to larger quarters. A cordial invitation is extended to all rockhounds to visit their new store and to inspect their larger and more complete stock.

C. F. Wilford, of Eugene, Ore., has some nice garnierite and glaucophane to trade.

Wyoming Minerals, of Laramie, Wyo., have just received from South Africa some very fine tiger eye quartz. You must order some of it!

Graffhams' Commercial Museum, of Ottawa, Kans., has nice Pala tourmaline, loose xls, and fossils in stock.

Adamite and other fine mineral specimens are featured by Ward's Natural Science Est., of Rochester, N. Y.

J. L. Davis & Son, of Hot Springs, Ark., announce that their supply of quartz xls has been increased 100%.

J. Gisler & Son, of San Francisco, Calif., are with us again and again they are featuring fine mineral specimens.

Need any agates? Nellie E. Turnidge, of Portland, Ore., has many nice ones.

The Colorado Gem Co., of Bayfield, Colo., announces that over 50 lots have been sold in Gem Village, the Rockhound Colony.

H. E. Powell Co., of Little Rock, Ark., have some nice cabochon material.

Fred Roberts (formerly Roberts & Stevens) of Monterey Park, Calif., extends a cordial invitation to collectors to drop in and inspect his new display and sales quarters.

MaryAnn Kasey, of Prescott, Arz., has some nice Arizona agates and minerals.

Fine coppers from Michigan may be obtained from Wm. E. Luoma, of Calumet, Mich.

Keweenaw Agate Shop, of Ahmeek, Mich., has another list of lapidary equipment.

Another list of fine specimens is featured by Wiener Mineral Co., of Tucson, Ariz.

Calcite xls of an unusual form are featured by the Mineral Foundation of Tucson, Ariz.

A. G. Parser, of New York City, is featuring another list of gem minerals.

Arthur & Lucille Sanger, of Chicago, Ill., can supply some attractive Mojave Desert jaspers and other cutting material.

A new advertiser is Felker Mfg. Co., of Torrance, Calif., who are the world's largest manufacturers of diamond abrasive wheels and cut-off equipment.

Another new advertiser is Geminlap Mart, of Milwaukee, Wisc., whose president is Benedict P. Bagrowski, a member of the R. & M. A.

Check the improved features of the new Streamliner diamond sawing machine, suggests its manufacturer, Hyatt Lapidary Equipment Co., of San Diego, Calif.

Some attractive calcite sand xls and groups from Devil's Hill, S. D., may be obtained from Chas. Preheim, of Freeman, S. D.

A complete lapidary shop in one small machine can be obtained from the RX Laboratory, of Torrance, Calif.

A new advertiser if George T. Davey, of Van Nuys, Calif., who can supply a stone gage in ring sizes.

Mrs. B. F. Nonneman, of Salinas, Calif., has in stock some colorful cabochon material for cutters.

Fine fossils, cabochons, and books are in stock, says Jno. B. Litsey, of Dallas, Texas.

More fine minerals are featured this month by Chuck Jordan, of Sepulveda, Calif.

E. B. Freeman, of Grand Junction, Colo., a new advertiser, has fine gem agate.

Slabbed gem material at wholesale prices can be had from the Western Trading Post, of Scramento, Calif., another new advertiser.

Fifth list of fine minerals from an old collection is presented by Hugh A. Ford, of New York City.

Lloyd M. Demrick, of San Francisco, Calif., has a good editorial in his ad on specimen selling. Be sure to read it.

Wapplerite and other choice minerals are listed in the ad of Hatfield Goudey, of Yerington, Nev.

Thompson's Studio, of Pomona, Calif., have an interesting fluorescent zinciferous aragonite.

Trager & Mick, of Morristown, Ariz., have some bargain assortments.

O. T. Branson, of Albuquerque, N. Mex., announces the opening of La Casa del Tesoro ("The Treasure House"). He is speciallizing in silver and gold jewelry and gems.

C. A. Weeks, of Meredith, N. H., speciallizes in pegmatite minerals.

Geo. W. Chambers, the Desert Rat of Encinetas, Calif., comments: I am sitting here like a long nosed old eagle overlooking the finest bathing beach and sea fishing in America. Eastern visitors welcome. Trailor space, bathing, fishing, free as air. Stop with me awhile. All information I possess on tourmaline mines and garnet are at your service. Look me up when in California.

International Mining Days Celebration To Be Held in El Paso, Texas

International Mining Days will be celebrated November 1st and 2nd, 1946, in El Paso, Texas.

This will be the third annual get-together of mining men from New Mexico, Arizona, Texas, Colorado and Mexico, with representation from other parts of the United States.

International Mining Days is sponsored by the Mining Committee of the El Paso Chamber of Commerce. It is not a convention. It is a get-together of the mining fraternity, with only one business session on the program. At this session a leader in the mining industry speaks.

The rest of the program is given over mainly to entertainment, with the Sourdough Supper as the climatic event. An exposition of mining machinery and equipment has again been scheduled this year.

Eugene M. Thomas, Dean of Engineering of the Texas College of Mines, has been reappointed General Chairman of the International Mining Days celebration. Other members of the Mining Committee are: Robert D. Bradford, R. J. Benson, Reuben S. Beard, M. S. Darbyshire, Jack Despins, Elbert Flanagan, C. C. Craigin, W. R. Blair, H. J. Kongabel, Homer C. Hirsch, Gus Momsen, Jr., William Knowles, E. C. Wise, A. V. Winther and A. L. Washburn.

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